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ANALEPTICS AND SYMPATHOMIMETIC SUBSTANCES*

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The substances that are used to restore a failing circulation can be divided into two classes, which, however, are not completely distinct, for some substances belong to both. The one class contains picrotoxin and strychnine among the non-proprietary substances, and cardiazol and coramine among the proprietary substances; these can all be used as medullary stimulants. The second class contains ephedrine and tyramine among the non-proprietary substances, and sympatol, veritol, and suprifen among the proprietary substances; these are used for their direct action on the heart and on the blood-vessels. Intermediate between these classes are substances like benzedrine which have both types of action.

On the whole medical practice in this country has confined itself to use of the first class. The custom of giving strychnine every four hours to persons dying of pneumonia is still prevalent, though not everyone who gives it has a good scientific argument ready to justify his action. There is one, however; for although strychnine has no action on the heart directly, it can stimulate the vasomotor centre in the medulla and cause a rise of blood pressure, which will in turn give a better coronary flow. It may be remarked how many there are who forget that the chief danger of a low blood pressure is in the diminution of the coronary flow, and that the higher the blood pressure the better the supply of oxygen to the heart becomes. Cardiazol, like strychnine and picrotoxin, has no direct action on the heart, and, this being so, we may ask how far it is justifiable to give it a name which suggests that it has. Coramine in very large doses does dilate the coronary vessels but without increasing the output, as Stoland and Ginsberg (1937) have shown; the main effect of coramine, however, is on the brain and medulla, and here again, in suggesting an important effect on the heart, the name is misleading. There are at least two reasons for reserving judgment on the efficacy of substances belonging to this first class: one is the difficulty of demonstrating their action on the blood pressure in animals; the second is the lack of evidence that low blood pressure is ever due to medullary failure. The vasomotor centre is not like the respiratory centre: when the medulla is destroyed respiration stops altogether; it does not continue at a slower rate, so that we have no difficulty in believing in the existence of a centre which controls the respiration. The blood pressure, however, does not fall abruptly; in the cat it is often maintained for several hours; there are undoubtedly centres in the spinal cord which play a part in maintaining the blood pressure as well as the vasomotor centre in the medulla.

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Carotid Sinus Reflex

Experimental evidence of the action of these substances has been obtained by my colleague Dr. M. Chakravarti, who has investigated the changes in the carotid sinus reflex. When both carotid arteries are clamped there is a fall of blood pressure in the carotid sinus beyond the clamp; impulses then pass from the carotid sinus to the vasomotor centre (or centres) and a reflex discharge of impulses from the centre causes vasoconstriction and a rise of blood pressure.

Chakravarti began by using decerebrate cats to exclude the influence of the anaesthetic, but he found that in these the carotid sinus reflex was almost unaffected; having learnt that Müller (1938) had obtained positive results in rabbits under urethane anaesthesia, he then made experiments on rabbits and also on decerebrate cats after giving nembutal to produce medullary depression and to diminish the size of the reflex. When picrotoxin, coramine, strychnine, or cardiazol was injected Chakravarti obtained an increase in the carotid sinus reflex, and in one or two experiments after injecting ephedrine also, though for the most part ephedrine had no effect. The following table shows the dosage of these substances which had equivalent effects and which increased the carotid sinus reflex by 15 to 20 mm. It also shows the maximum doses of these substances used in human therapy, as well as the ratio of this dose to the dose necessary to increase the carotid sinus reflex in the cat or rabbit.

Substance	Dose Increasing Carotid Sinus Reflex by 15 to 20 mm. (A)	Maximum Therapeutic Dose (B)	Ratio B/A
Picrotoxin	3 mg.	8 mg.	2.6
Coramine	0.2 gm.	0.5 gm.	2.5
Strychnine	1 mg.	2 mg.	2.0
Cardiazol	0.1 gm.	0.1 gm.	1.0

The figures in the table indicate the order of efficiency of the different substances, but the differences in the ratios given in the fourth column are small, and no great importance can be attached to them; it is impossible to make reliable comparisons of potency in animals of the size of cats and rabbits, because a sufficient number cannot be used.

From the results it can be concluded that these substances certainly do have an action on the vasomotor centre, or at least on some part of the central mechanism which controls the blood pressure. On the other hand, the amounts which must be given to a rabbit or a cat to

demonstrate this action are very large, being from 40 to 50 per cent. of the human therapeutic dose, so that in man this action can scarcely be exerted.

The Awakening Action

While it is not easy to make a quantitative comparison of the action of substances like picrotoxin, cardiazol, coramine, and strychnine on the medullary centres controlling the blood pressure, it is easy to compare their potency in other directions. Mice which are narcotized by the administration of a barbiturate such as nembutal can be aroused by the injection of these substances, and the awakening power can be estimated. Chakravarti injected groups of mice intravenously with nembutal, using a dose which kept 100 per cent. narcotized for two hours. He injected the awakening agent twenty minutes later, for he found that the respiratory rate was lowest in the largest percentage at this time. His doses were stated in terms of the average lethal dose: that is to say, he determined the awakening effect of one-half, one-quarter, and one-eighth of the average lethal dose of each substance, and by plotting the results graphically was able to estimate the dose of each substance which would awaken 50 per cent. of the mice within one hour. This he called the awakening dose, and was able to compare it with the lethal dose, and so to get a value for the relative awakening power for each substance. The values for cardiazol, picrotoxin, strychnine, and coramine were 5.6, 5.0, 4.2, and 2.9, respectively; that is to say, the dose of cardiazol killing 50 per cent. of mice was 5.6 times as great as the dose required to awaken within one hour 50 per cent. of mice narcotized with nembutal. For benzedrine the ratio was as high as 12.9, and for ephedrine as low as 2.2.

A comparison made in this way suggests that there are important differences between the various compounds in their power to arouse from mild narcosis produced by barbiturates. A different picture is, however, obtained when the awakening dose, determined in mice as described, and expressed in mg. per kg., is compared with the maximum human therapeutic dose in mg. The ratio of the human dose to the awakening dose is then approximately the same for picrotoxin, cardiazol, strychnine, and coramine, being 8.0, 6.9, 6.6, and 6.7, respectively; for benzedrine it is lower, being 2.5, and for ephedrine it is 0.2. These results indicate that there is little difference between the four medullary stimulants, but that all four are better than either benzedrine or ephedrine.

Barbiturate Poisoning

Of more practical importance were Chakravarti's observations on the effect of giving to groups of mice a dose of the barbiturate nembutal, which by itself would kill 80 per cent., and combining with this a dose of the stimulant substance. Tested by this method, picrotoxin and cardiazol stood out as far superior to all the others, and the antagonism between these substances and the barbiturate was clearly revealed. When one average lethal dose of picrotoxin was injected the mortality was reduced to 38 per cent., and when twice this amount was given the mortality was reduced to 6 per cent. Similarly with cardiazol; the administration of one average lethal dose reduced the mortality to 13 per cent., and of twice this amount to 7 per cent. With the other substances no such antagonism was observed; the mortality due to the nembutal was unchanged by one or two average lethal doses of strychnine; after giving benzedrine, coramine, or ephedrine the mortality increased to 100 per cent., whether one or two average lethal doses were given. Here we have an indication that, in barbiturate poisoning, picrotoxin and cardiazol are the substances with much the greatest effect, and should be used exclusively.

Convulsive Action

Recently cardiazol has been much used in the treatment of schizophrenia. Convulsions are, however, produced by all these substances, even by ephedrine, and a simple method of demonstrating this is by intravenous injection into pigeons; some substances cause vomiting in addition. Picrotoxin, cardiazol, and ephedrine cause both vomiting and convulsions, while strychnine, coramine, and benzedrine cause convulsions only. There appears, therefore, to be a closer similarity in the central actions of picrotoxin, cardiazol, and ephedrine than in that of the others. Since ephedrine exerts its central action in large doses only—for example, 30 to 40 mg. for a pigeon—its use as a convulsant in human therapy is excluded. Between picrotoxin and cardiazol there seems to be no important difference; picrotoxin is approximately thirty times stronger, and could very well be used instead of cardiazol.

Action on the Respiration

Chakravarti has also compared these substances for their effect in stimulating respiration. He attempted to do this first in decerebrate cats in which the respiratory rate was reduced by repeated injections of nembutal. These substances produced a rise in respiratory rate, but he found again that a quantitative comparison could not be made in these animals. In mice narcotized with nembutal, however, he was more successful. He determined the mean respiratory rate in groups of twenty-five to thirty mice, and obtained results which show that cardiazol is much more potent than strychnine, coramine, and picrotoxin. These three do not greatly differ from one another, but all are less than half as active as cardiazol when doses of equal toxicity are given. On the other hand, ephedrine and benzedrine are both much more active than cardiazol. When these three substances are compared in terms of the average lethal dose, then the stimulant action on the respiration of one-half the average lethal dose of cardiazol is similar to that of 1/64 of the average lethal dose of benzedrine and to that of 1/256 of the average lethal dose of ephedrine.

In summarizing the experimental observations on the four medullary stimulants it is difficult to avoid disappointment. None of them can be shown to have any valuable action on the vasomotor system. Cardiazol appears to be the best respiratory stimulant, but otherwise it is not better than picrotoxin. For use in schizophrenia, when a convulsant action is desired, or for recovering those who are dying from barbiturate poisoning, picrotoxin is at least as good as cardiazol, and certainly cheaper.

Restoration of the Blood Pressure

That medullary stimulants have little value in circulatory failure is not very surprising, since there is little evidence that the low blood pressure is due to failure of medullary control. The low blood pressure is more likely to be due either to the liberation from damaged tissue into the blood stream of substances which increase the permeability of the capillaries, or perhaps to the failure of the vasoconstrictor impulses to exert their usual effect when the supply of cortical hormone is exhausted.

Most other forms of circulatory failure are due essentially to failure of the heart muscle, and it is probably

more rational to use therapeutic agents which directly stimulate the heart, such as ephedrine and the other sympathomimetic substances, than to employ medullary stimulants. In this country the use of these sympathomimetic substances has been small, apparently because it is little known. If a sudden fall of blood pressure occurs during spinal anaesthesia as shown by disappearance of the pulse in the temporal arteries, ephedrine is injected intramuscularly in a dose of 30 to 60 mg. But apart from its employment by anaesthetists, ephedrine is not much used to restore a failing circulation. In Germany, as a result of the efforts of the late Paul Trendelenburg, sympatol was introduced. This is the same as synephrine; it differs from adrenaline in having only one –OH group in the ring; the side-chain is the same. Its effect is qualitatively like that of adrenaline, but its vascular action is much less intense, though more prolonged. It is stated to have the advantage over ephedrine of producing no toxic effects. Gremels (1936) points out that it has the great advantage over adrenaline that it causes a much smaller increase in the oxygen consumption of the heart. He has shown that if the pressure in the left auricle is recorded, and large doses of adrenaline are given repeatedly, the rise of auricular pressure produced by adrenaline becomes steadily bigger, indicating an increasing degree of failure of the left ventricle. He considers that this failure is due to a partial asphyxiation of the heart muscle owing to the enormous increase in the oxygen consumption which adrenaline causes. If now sympatol is injected in doses which cause the same pressor response as the adrenaline, then after two or three doses the rise in left auricular pressure becomes much less, and the signs of heart failure disappear. Thus Gremels finds that sympatol actually repairs the damage done to the heart by adrenaline.

Sympatol has been much used in the treatment of incipient heart failure in pneumonia. It can be given by subcutaneous injection every half-hour, and appears to be a far more satisfactory and logical treatment than is the repeated injection of strychnine. In action sympatol has much less vasoconstrictor effect than adrenaline in relation to its power to improve the force of the heart-beat.

Other substances having a similar action are suprifen and veritol, and perhaps tyramine. The relative advantages of all these substances, including ephedrine and sympatol, are not easy to assess, and whatever differences are found experimentally the substances are, I think, all worth careful clinical trial in circulatory failure where the heart is becoming exhausted. They do not seem to have had such a trial in this country yet, in spite of the great probability that they are more effective than substances acting on the medulla.

Action of Sympathomimetic Agents

In a lecture delivered here not long ago Gaddum (1938) put forward a hypothesis concerning the action of ephedrine which I believe can also be used to explain the action of other sympathomimetic substances. Gaddum and Kwiatkowski (1938) observed that low concentrations of ephedrine augment the constrictor action of adrenaline on the blood-vessels of the rabbit's ear, the cat's nictitating membrane, and the frog's heart; further, they observed that ephedrine augments the action of sympathetic nerves on these organs. They attributed these observations to the inhibition by ephedrine of the amine oxidase which destroys adrenaline; Blaschko, Richter, and Schlossmann (1937) have shown that *in vitro* such an inhibition occurs. Thus the augmentation of the action of adrenaline was due to a slower rate of destruction of adrenaline or of the humoral transmitter liberated by the sympathetic nerves; Gaddum compared this augmentor action of ephedrine to that of eserine on the response to acetylcholine.

I have previously made observations not only on ephedrine but also on tyramine, and since there were many points of resemblance in the action of the two substances and in the relation of each to the action of adrenaline, it occurred to me that probably many of the effects of tyramine could also be explained in the way Gaddum has explained the action of ephedrine. Tainter and I (Burn and Tainter, 1931) observed that after removal of the superior cervical ganglion and degeneration of the post-ganglionic fibres, the pupil of the cat's eye no longer dilates when large doses of tyramine are injected, and is only very slightly affected by large doses of ephedrine, although of course the denervated pupil responds to much smaller doses of adrenaline than the normal. Gaddum supposed that the action of ephedrine on the normally innervated pupil must depend on the slowing down of the rate of destruction of the humoral transmitter released from the nerve endings; when the nerves degenerated and no more humoral transmitter was liberated ephedrine ceased to act. I thought that the same explanation would apply to tyramine, though with this difference. Tyramine does not inhibit the action of amine oxidase as ephedrine does; but since tyramine is destroyed by the oxidase it is clear that when tyramine and adrenaline are both present the rate at which the enzyme can destroy adrenaline is diminished because some of the molecules of enzyme are engaged in destroying tyramine. This interference with the destruction of one substance by another is called substrate competition, because the two substrates are supposed to compete for the enzyme.

My colleague Dr. Edith Bülbring has made some observations which support this view. She has demonstrated that the constrictor effect of adrenaline becomes greater after the addition to the blood of a certain amount of tyramine. Working also on the cat in which the brain has been destroyed, after exclusion of the suprarenal glands she has found that the contractions of the nictitating membrane caused by doses of 5 μg. and 10 μg. adrenaline were increased by infusing a 1 in 10,000 solution of tyramine. Similar observations were made when the cervical sympathetic chain was stimulated.

A third observation was made on the spleen volume of the cat, which was recorded under urethane–chloralose anaesthesia. Investigations were made into the effect of adrenaline in causing a diminution in the volume when the doses were injected intravenously. Tyramine was then injected in a dose of 0.8 mg., and the injections of adrenaline were repeated. The effect of 0.6 μg. after the tyramine was greater than that of 1 μg. before. Dr. Bülbring's work is still in progress, but it indicates from the results obtained already that tyramine augments the action of adrenaline, though not so powerfully as does ephedrine. Tyramine is destroyed by the amine oxidase which destroys adrenaline. When tyramine and adrenaline are both present the oxidase must therefore be partly occupied in destroying tyramine and cannot inactivate the adrenaline as quickly as the absence of tyramine; the effect of adrenaline is therefore augmented.

Action of Cocaine

There has been divergence of view about the peripheral action of cocaine since last century. Limbourg (1892) showed that when dropped into the eye after removal of the superior cervical ganglion it did not cause dilatation of the pupil, whereas if dropped into the normally innervated eye it did. From this observation sprang the

suggestion that cocaine was a sympathomimetic substance. In 1910 Fröhlich and Loewi showed that cocaine augmented the action of adrenaline on the blood pressure and on the pupil, and in 1926 Tainter and Chang showed that it abolished the action of tyramine on the blood pressure. All these observations seemed to connect cocaine somehow or other with the sympathetic system, but it was certainly not clear how. Tainter and I in 1931 stated that we did not think cocaine could be regarded as sympathomimetic, since it had no stimulant action on the isolated heart or on the isolated auricles; further, in doses which inhibited the action of adrenaline it acted as a stimulant of the muscle of the isolated intestine or of the cat's uterus; again, when injected into the arterial cannula taking blood from a pump to the hind leg of a dog cocaine caused vasodilatation.

If we consider the vascular action, we have recently observed that in the perfused vessels of the dog's hind leg, when no adrenaline is present in the blood, the injection of doses such as 1 to 2 mg. cocaine causes a slight vasoconstriction. When larger doses of cocaine are used, and when the tone is maintained by adrenaline, the injection causes vasodilatation, as Tainter and I found. This action, constrictor in small doses and dilator in larged doses, especially when adrenaline is present, is reminiscent of the action of ephedrine. In many experiments ephedrine causes vasodilatation in the same circumstances, and we can explain the action of cocaine as Gaddum has explained that of ephedrine, by supposing that the cocaine has attached itself temporarily to the sympathetic receptors so that the adrenaline molecules are denied access. On the isolated intestine my colleague Macgregor (1939) has confirmed earlier workers that the stimulant action of cocaine in ordinary dosage is replaced by an inhibitory action in larger doses; sometimes this inhibitory effect is seen with ordinary doses. Macgregor found that the same was true for the virgin cat uterus. Hence so far as the blood vessels and smooth muscle are concerned cocaine can be regarded as sympathomimetic; even the stimulant action on the intestine and uterus has a parallel in the stimulant action of tyramine which has been described, and which once led Tainter to describe tyramine as musculotropic. On the pupil, Macgregor has made the interesting discovery that the effect of denervation depends on the mode of administration. After removal of the superior cervical ganglion, and degeneration of the post-ganglionic fibres, instillation of cocaine into the conjunctival sac is not followed by pupil dilatation; if, however, the cocaine is injected intravenously the denervated pupil dilates more than the normal. This result seems to indicate that the absorption of cocaine from the conjunctival sac after degeneration of the post-ganglionic fibres must be very slow. With the exception of the heart, then, other organs respond to cocaine in such a way as to indicate that it is a sympathomimetic substance. If it has any sympathomimetic effect on the heart, this is masked by a toxic action.

Action of Procaine

Macgregor has made the interesting discovery that procaine has a sympathomimetic action which is even less doubtful than that of cocaine, since he was able to observe a stimulant action on cardiac muscle. When the isolated auricles of a cat's heart were suspended in Locke-Ringer solution, the addition of procaine to make a concentration of 1 in 50,000 caused an increase in the amplitude of the contractions.

On the pupil, procaine was found to exert a dilator action when it was injected intravenously. There was no dilatation when procaine was applied externally. When one pupil was denervated by removal of the superior cervical ganglion, procaine produced a slightly greater dilatation in it than in the normal pupil. In the isolated intestine procaine caused inhibition in those circumstances in which cocaine caused inhibition; in the isolated uterus of the virgin cat the inhibitor effect of procaine was, however, very slight. Procaine has previously been shown to augment the pressor action of adrenaline, and Macgregor has found that it augments the pressor action of tyramine also. In isolated tissues like the uterus procaine abolishes the inhibitor action of adrenaline.

Thus we have in procaine, too, a substance with a sympathomimetic action of its own, and able in some circumstances to augment the action of adrenaline and in others to depress it. To complete the evidence for this interpretation of the action of cocaine and procaine it must be shown that these two substances can inhibit the action of amine oxidase. Mrs. Philpot, working in the Biochemical Laboratory, has recently been able to do this. She has measured the increase in the oxygen uptake of liver extracts due to the addition of tyramine or adrenaline, using the Warburg manometric technique. When cocaine or procaine was added the extra oxygen uptake was inhibited. Thus we can extend the hypothesis put forward by Gaddum to explain the action of ephedrine, not only to the related substance tyramine, but also to two substances the only relation between which is that they are both local anaesthetics. Cocaine and procaine have no chemical similarily, and the similarity of their sympathomimetic action naturally gives rise to the question whether all local anaesthetics are sympathomimetic. Tripod, working in my laboratory, has made a beginning of this study, and has so far observed that stovaine, butyn, and percaine all inhibit intestinal rhythm in the same manner as adrenaline.

Summary

Cardiazol, coramine, picrotoxin, and strychnine are all able to increase the carotid sinus reflex in the rabbit or the cat when the reflex is first depressed by nembutal. Unfortunately the doses necessary are very high, being from 40 to 50 per cent. of the maximum human dose.

Picrotoxin and cardiazol are both of value as antidotes in barbiturate poisoning; the other substances are not.

Picrotoxin should be just as efficient as cardiazol for use in the treatment of schizophrenia.

As a respiratory stimulant in nembutal narcosis in mice benzedrine and ephedrine are most efficient, and then cardiazol. Coramine, strychnine, and picrotoxin are very feeble.

Reasons are given for regarding substances like ephedrine and sympatol as more likely to be of use in circulatory failure than medullary stimulants.

Further observations on the pharmacology of tyramine, cocaine, and procaine are described.

References

Blaschko, H., Richter, D., and Schlossmann, H. (1937). *Biochem. J.*, **31**, 2187.
Burn, J. H., and Tainter, M. L. (1931). *J. Physiol.*, **71**, 169.
Fröhlich, A., and Loewi, O. (1910). *Arch. exp. Path. Pharmak.*, **62**, 160.
Gaddum, J. H. (1938). *British Medical Journal*, **1**, 713.
—— and Kwiatkowski, H. (1938). *J. Physiol.*, **94**, 87.
Gremels, H. (1936). *Arch. exp. Path. Pharmak.*, **182**, 1.
Limbourg, P. (1892). Ibid., **30**, 93.
Macgregor, D. F. (1939). *J. Pharmacol. exp. Ther.* (in the press).
Müller, R. (1938). Communication to International Physiolog. Congress, Zurich.
Stoland, O. O., and Ginsburg, A. M. (1937). *J. Pharmacol. exp. Ther.*, **60**, 396.
Tainter, M. L., and Chang, D. K. (1926). Ibid., **30**, 193.

WEIL'S DISEASE IN COAL-MINERS

BY

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In 1886 Weil described four cases of infectious jaundice characterized by the presence of fever, enlargement of the liver and spleen, nephritis, and a liability to febrile relapses. He considered that these cases differed from any other previously described forms of jaundice and presented them as a new clinical entity. Subsequently other cases were reported, but it was not until 1915 that Inada and Ido showed the causal organism to be a spirochaete, which was later named *Leptospira icterohaemorrhagiae*. In this country isolated cases have since been recorded, and a comprehensive and excellent report of a large outbreak among coal-miners in Scotland was made by Buchanan (1927). More recently a valuable account of the epidemiology has been given by Alston and Brown (1935), who also comment on the increasing frequency of the disease in this country. It seems quite clear that the incidence is confined to certain occupations, those mainly affected being sewer workers, field workers, coal-miners, and fish workers. The largest single outbreak in coal-miners in the British Isles is referred to above. The occurrence of six cases in the South Wales coal-field, apparently the first recorded in this area, prompted the present contribution.

Case Records

Of the six men whose cases are here reported three worked in the same part of the same pit and two others were employed in a colliery some considerable distance away. In each instance it was found that they worked in very wet places, and it was known that the pits concerned were infested with rats. In all six cases the clinical diagnosis was confirmed by positive serological results. The details of one further fatal case were reported by the local practitioner. The history strongly suggested the possible diagnosis of Weil's disease, but as this case was not under my direct observation it is not included. In this series of cases very full and detailed investigations were carried out in each instance by Dr. A. F. Sladden (p. 605). Brief mention only will be made of these findings, as they form the subject of a separate paper.

CASE I

M. W., a man aged 48, was admitted to hospital on November 20, 1936. He was suddenly taken ill six weeks previously with an attack of shivering, sweating, weakness, generalized muscular pains, and vomiting, followed a week later by the appearance of jaundice. There was frequency of micturition accompanied by haematuria. On admission the temperature was 101° F., there was definite jaundice, and the liver was palpably enlarged. A few days later he complained of severe occipital headache and was somewhat delirious. A lumbar puncture was performed. The cerebrospinal fluid showed a slight increase of cells, increased protein content, and a Lange curve of paretic type. The Wassermann reaction was strongly positive in the fluid and weakly positive in the blood. Examination of the urine revealed blood, bile, albumin, and many granular and hyaline casts, and the blood contained 171 mg. of urea per 100 c.cm. The van den Bergh reaction showed a jaundice of obstructive type. A blood count revealed an anaemia in which a characteristic feature was the high monocyte count. The blood pressure was 108/72. The possibility of spirochaetal jaundice was considered, as the serum agglutination reaction for leptospira was strongly positive. The patient made steady progress; at the end of ten days the jaundice had faded and the renal function showed marked improvement. The blood Wassermann reaction became negative, and on January 21, 1937, the patient was discharged cured.

CASE II

J. D., a man aged 47, was admitted to hospital on September 8, 1937. He was convalescent, and was referred to hospital as he had been working in the same site as Case I. He was slightly jaundiced and gave a history that eight weeks previously he had had a sudden attack of vomiting associated with generalized muscular pains. This was followed by epistaxis, and about two weeks after the onset of the illness jaundice was first noticed. The faeces were dark in colour, but no urinary symptoms were noted. On examination there was very slight jaundice but the liver was not palpable; the urine showed no gross abnormality. The blood pressure was 124/72. The agglutination reaction for leptospira was positive. He made an uninterrupted recovery.

CASE III

D. H. J., a man aged 39, was admitted to hospital on August 1, 1937. He was very ill, and in fact died a few days after admission. I am indebted to Dr. Alfred Davies, his own practitioner, for the notes of his previous history. Six weeks before admission he complained of sudden severe generalized pains in the head, back, and limbs, accompanied by shivering. The temperature was 104° F. In a few days he became deeply jaundiced and vomited a great deal. The jaundice began to fade, but there was frequent epistaxis. On admission to hospital the temperature was 99.4° F.; he was very drowsy and jaundiced, and complained of epigastric pain. The urine passed was scanty and contained blood and albumin. The blood urea was 537 mg. per 100 c.cm. and the blood Wassermann reaction proved negative. Clinical examination showed no hepatic enlargement, but there were a few small subcutaneous haemorrhages. Agglutination tests for leptospira were strongly positive. As indicated, he became progressively worse and died.

CASE IV

R. L., a man aged 42, was admitted to hospital on October 20, 1937. A week before admission he had had a sudden attack of vomiting, muscular pains, and extreme weakness. Two days later he was jaundiced and labial herpes was present, the eruption afterwards becoming haemorrhagic. On admission the pulse was rapid and the temperature 99°. During the next four weeks there were periodic rises up to 100° or 101°. He was deeply jaundiced and lethargic. The liver and spleen were not palpable. A few purpuric spots were seen on the body. The urine contained a trace of albumin, bile, and a few red blood cells. The blood Wassermann reaction was negative. The blood pressure was 102/65. The van den Bergh reaction showed an obstructive type of jaundice. Serological tests were negative on the seventh day but strongly positive on the sixteenth day of the illness. Urine was injected into a guinea-pig and *L. icterohaemorrhagiae* was identified in the spleen and adrenal medulla of the killed animal. The patient made satisfactory progress and was discharged cured on November 29, 1937.

CASE V

G. J., a man aged 39, was admitted to hospital on January 1, 1938. A week previously there was sudden onset of shivering, generalized muscular pains, and extreme weakness. Two days later jaundice was noted. On admission the temperature was normal, but ten days later it rose to 100.6° and remained at this level for a further ten days. He was deeply jaundiced, and scattered petechiae were present on the skin. The liver and spleen were not palpable. Blood examination showed the typical monocytosis, the blood urea was 117 mg. per 100 c.cm., and the van den Bergh reaction disclosed jaundice of an obstructive type. The blood Wassermann reaction was negative. The blood pressure was 125/75. A direct examination of the blood by Schüffner's method revealed the presence of a few leptospirae. The cerebrospinal fluid showed a pleocytosis with a "pseudo-positive" Wassermann reaction. Serological tests showed the existence of leptospirae. This patient was gravely ill on admission, but he progressed satisfactorily and was ultimately discharged. He was again seen in October, 1938.

All serological tests were then negative. He complained of defective vision of the left eye, and examination showed the presence of a corneal opacity. The ophthalmological report suggested this was probably a healed ulcer attributable to a herpetic lesion of the cornea.

CASE VI

O. G., a man aged 25, was admitted to hospital in a very ill condition. Fourteen days before admission, while at work, he had a shivery attack associated with aching pains in the back and limbs and marked weakness. Jaundice appeared four or five days later, followed by labial herpes and very troublesome epistaxis which was not controlled by plugging. He was admitted to hospital on December 31, 1937. The temperature was 100°, he was deeply jaundiced, haemorrhagic herpes was present, and there was a purpuric rash on the chest and upper abdomen. The liver was palpably enlarged, and small shotty glands were palpable in the neck, axillae, and groins. It was noted that the diastolic blood pressure (118/36) was unusually low. At first he was extremely ill, and epigastric pain and vomiting soon became prominent features. A blood-urea estimation gave a reading of 414 mg. per 100 c.cm.; a trace of albumin was present in the urine, and microscopy showed the presence of many granular casts. A blood count revealed an anaemia with an increased polymorphonuclear and monocyte count. The cerebrospinal fluid was completely negative and the blood Wassermann reaction doubtfully positive. Serological tests for leptospira were positive. He was given calcium gluconate intramuscularly daily and, in view of his very grave condition, one injection of antileptospiral serum. He gradually improved and was discharged cured.

Diagnosis

The feature in Case I which first led to a suspicion of the real nature of the disease was the association of jaundice and nephritis. This association has been noted by other writers, and is a diagnostic point of great importance. The sudden onset, with generalized muscular pains and extreme weakness, was almost constant in each case of this series. Among haemorrhagic manifestations epistaxis and herpes were most commonly seen, and in Case V the involvement of the cornea has left some degree of permanent impairment of vision. An interesting feature in Cases I and V was the finding of a positive Wassermann reaction in the cerebrospinal fluid. After recovery the reaction became negative. Case III was extremely ill on admission, and at first the patient was thought to be suffering from uraemia. The associated jaundice, his occupation, and our previous experience rapidly suggested the true diagnosis. One particularly interesting observation, of which no mention seems to have been recorded in other outbreaks, is the finding of a monocytosis in the blood picture. In all cases, as already indicated, the clinical diagnosis was verified by serological investigation and the finding of a positive agglutination reaction for leptospira.

Treatment

In the first two cases no special line of treatment was employed, but in Cases IV, V, and VI a series of calcium gluconate injections were given intramuscularly; the impression gained was that this treatment was of some value. In Case III the patient was so seriously ill on admission that it is doubtful if any treatment would have been of avail.

Anti-leptospiral serum was given in Case VI only, and it cannot be said that any definite conclusion was reached as to its value. Certain writers (Murgatroyd, 1937; Fairley, 1934; Davidson *et al.*, 1934) are of the opinion that serum treatment is of undoubted value and that it should be administered as early as possible in the course of the disease. A recent paper by Robertson (1938) appears to confirm this view. The use of prophylactic vaccines in the presence of a widespread outbreak or in workers known to be exposed to infection has also been suggested (Alston and Brown, 1935).

Discussion

It is obvious that Weil's disease is far more common in this country than was once thought. The disease is essentially associated with certain occupations. The common factor is the presence of the infected rat, whose excreta are disseminated by water or wet conditions; the individual is infected through accidental abrasions or through the mucous membranes of the eye or nose. It is important to note that the organism flourishes only in fresh water. If the disease is becoming more common it seems possible that transmission by fresh-water bathing, in these days so popular a form of recreation, may well become a matter for serious consideration. Robertson (1938) has recently reported four cases where the infection appears to have originated from this source. This seems all the more important, since, as pointed out by Murgatroyd (1937), the organism has been found in the urine of a recovered case thirty-three weeks after the onset of the disease, and long after all its manifestations had disappeared. The possibility of spread of infection here is obvious. Again, as pointed out by Alston and Brown, workers exposed to infection may harbour what may be termed a "subclinical" form of the disease. In a series of apparently healthy sewer workers investigated it was found that 20 per cent. showed positive serum agglutination reactions for *L. icterohaemorrhagiae*. As a result of this investigation these writers suggest that prophylactic inoculation of workers exposed to the risk of infection would seem to be indicated. A further point of importance is that the disease does not always exhibit itself in its well-recognized characteristic form. Meningitis may be the presenting picture, as in the case described by Murgatroyd, who draws attention to the fact that it would be wise to consider a possible diagnosis of Weil's disease in many cases of so-called "aseptic meningitis." Again, it is recognized that in 50 per cent. of cases there may be no jaundice. This being so, in all cases of pyrexia of unknown origin the possibility of spirochaetal infection should be considered.

In this present series of cases the symptoms were fairly typical. The association of jaundice and nephritis, and the sudden onset of generalized muscular pains and weakness, were features which soon indicated the correct diagnosis. One observation of interest was that in three cases the blood pressure was definitely low. This seemed significant in view of the general complaint of weakness, and particularly so since necropsies of infected guinea-pigs have shown the presence of leptospira, especially in the adrenal bodies. With regard to treatment, no definite inference can be drawn from this short series. All but one patient recovered, no serum, in effective dose, having been administered to any case. Four of these patients were extremely ill, and it seems possible, from the experience of other workers, that the use of serum might have shortened the duration of illness. It is recognized, however, that to be effective serum must be given early, and in this series it was not our good fortune to attend the patients before jaundice had appeared and the disease was well established.

Certain final conclusions present themselves: (1) The incidence of Weil's disease is definitely on the increase. (2) The possibility of atypical forms should be borne in

mind. (3) Known infected communities should be investigated in view of the possibility of carriers. (4) Active prophylactic measures, both by inoculation and by extermination of rats, should be considered.

Summary

Six cases of Weil's disease occurring in coal-miners are described and certain points of particular interest in these cases are discussed.

Attention is drawn to the increasing incidence of the disease in its various forms, and the need for preventive measures is stressed.

REFERENCES

Alston, J. M., and Brown, H. C. (1935). *British Medical Journal*, **2**, 339.

Buchanan, G. (1927). Med. Res. Cncl. Spec. Rep. Ser., No. 113, London.

Davidson, L. S. P., Campbell, R. M., Rae, H. J., and Smith, J. (1934). *British Medical Journal*, **2**, 1137.

Fairley, N. H. (1934). Ibid., **2**, 10.

Murgatroyd, F. (1937). Ibid., **1**, 7.

Robertson, K. M. (1938). Ibid., **2**, 1300.

WEIL'S DISEASE IN SOUTH WALES

CLINICAL PATHOLOGY

BY

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Rather elaborate investigations were made in this series of cases, seven of which were under the care of Dr. Esmond Rees at Swansea General Hospital and the others seen with Dr. J. Lloyd Davies of Swansea. Seven of these men were coal-miners and two were farmers: A. W. lived on a rat-infested farm in a village within the coal-field where several coal-miners dwelt, and T. W. R., the last case, was a dairy-farmer on whose farm rats were intermittently a pest. A detailed clinical account of the first six coal-miner cases is given in this issue by Dr. Rees (p. 603). Of the other three it is sufficient here to say that the farmer (A. W.) when first seen was acutely ill with fever, jaundice, herpes, pneumonia, uraemia, and meningitis, and died a few hours later. W. T., a coal-miner, was not very acutely ill, but had short-lived fever, herpes, pains in the chest, and later jaundice, nephritis, mild meningitis, and low blood pressure (105/60). This man reported that during the past year three of his mates had jaundice and illness which he believed had been similar to his own. T. W. R., a dairy-farmer aged 52, originally came to hospital on account of dysuria, which had followed a period of some ten days' general malaise. Enlarged prostate was found and cystotomy done, but a few days later jaundice was noticed and the possibility of a leptospiral infection came up for consideration in the fourth week of the illness.

Diagnosis was verified in each case by the specific agglutination test with leptospira, carried out very kindly by Major Brown at the Wellcome Bureau of Research; his ready help and advice are cordially acknowledged. There are certain technical difficulties in the performance of the agglutination test which, in Major Brown's opinion, make it desirable for the present to centralize the carrying out of these tests, and therefore no antigen is available for general laboratory use.

Laboratory Investigations

The various laboratory investigations made in this series are set forth below in tabulated form. The main points noteworthy are:

1. The reliability of the agglutination test when carried out by expert hands. Our "control" cases, with jaundice but with history and clinical manifestations not compatible with Weil's disease, all gave negative tests.

2. If the patient comes under observation very early in the course of the infection agglutinative power may not have developed; in such circumstances the direct demonstration of leptospira in the blood by the use of Schüffner's technique is valuable and satisfying, and this technique was applied successfully in some of the later cases of this series. The persistence of blood infection after six months in the patient G. J. is remarkable.

3. A full blood count, with differential and estimation of absolute values of the white-cell categories, is most valuable as an aid to diagnosis and far more reliable than a mere percentage differential from a film of blood. The characteristic changes are: Polymorph increase and monocyte increase but no alteration in absolute lymphocyte figures; as a result the lymphocyte:monocyte ratio is greatly altered, and instead of the normal (about 85:15) it may become 60:40, or even as low at 50:50. This applies only to the earlier stages of the illness. In catarrhal or other forms of jaundice any alterations in the lymphocyte:monocyte ratio are of an entirely different order.

4. Among these cases was occasionally found a *temporary* positive Wassermann reaction, especially in the cerebrospinal fluid.

5. The few gastric analyses made suggest the possibility of hypochlorhydria and achlorhydria as factors favouring the establishment of infection if leptospira be swallowed.

6. Animal inoculation methods, though conclusive when positive, are not uniformly successful—witness the case of G. J. As they are tedious and rather expensive it is convenient if for routine diagnosis one can dispense with their use.

7. Blood and urine analyses revealed the frequency of severe uraemia in this disease and the possibility of recovery in very acute cases.

8. Van den Bergh tests show very high degrees of bilirubinaemia in the early stages of infections, and as the jaundice is of the obstructive type there is correspondingly high saturation of the urine with bilirubin.

9. Urobilinogen was not increased in the urines of any of the cases tested, nor was there excess of urobilin; the existence of severe nephritis may explain the failure of urobilinogen to pass through the kidneys.

Guinea-pig Inoculations

Some guinea-pigs appear to be relatively immune to leptospira, so that a negative experiment does not necessarily exclude. Several of the animals (Table VI) failed to develop illness or jaundice, but after a period of some weeks agglutinins in significant amount were found in their sera, and in silver-stained sections of the organs leptospira could occasionally be observed, particularly in the adrenals. In view of the low blood pressures recorded in human cases of Weil's disease this observation is clearly of considerable clinical interest.

Preventive Methods

Since the appearance and recognition of this series of cases in one locality active measures have been taken by the colliery owners to rid the mines of rats, and it is encouraging to note that no further cases of Weil's disease have appeared in the mines concerned.

TABLE I.—*Blood Examinations*

Case	Day of Illness	Serum Reaction with Leptospira	Leptospira in Blood	Guinea-pig Inoculation
M. W.	54th	Positive 1 : 10,000	Not tested	Negative
J. D.	60th	,, 1 : 30,000	,, ,,	
D. H. J.	42nd	,, 1 : 10,000	,, ,,	Positive
R. L.	7th	Negative	,, ,,	,,
	16th	Positive 1 : 300	,, ,,	
	56th	,, 1 : 30,000	,, ,,	
O. G.	9th	,, 1 : 1,000	? Positive	Negative
G. J.	10th	,, 1 : 300	Positive	,,
	198th	,, 1 : 3,000	,,	
	286th		Negative	
A. W.	14th	,, 1 : 30	Positive	Positive
W. T.	17th	,, 1 : 3,000	Negative	
T. W. R.	23rd	,, 1 : 1,000	Not tested	

Sera from seven "control" jaundice cases all gave negative reactions with leptospira when tested. These seven cases included obstructive jaundice, catarrhal jaundice, febrile jaundice, hypertrophic biliary cirrhosis, and haemolytic jaundice.

TABLE II.—*Blood Counts*

Case	Period of Illness in Weeks	R.B.C. (Hb %)	W.B.C.	Polym.	Lymph.	Monocytes	Lymphocyte : Monocyte Ratio
M. W.	7th	3,424,000 (66%)	10,800	7,506	1,674	1,242	58 : 42
J. D.	9th	4,104,000 (60%)	8,800	6,160	1,364	1,100	51 : 49
	13th	3,968,000 (58%)	11,400	7,923	2,223	969	67 : 33
	15th	3,940,000 (72%)	13,200	6,270	6,336	526	92 : 8
O. G.	2nd	3,810,000 (82%)	24,600	21,353	1,673	1,574	51 : 49
G. J.	2nd	4,248,000 (78%)	12,000	9,660	900	1,320	41 : 59
	29th	6,230,000 (109%)	14,400	7,280	5,472	504	91 : 9
	40th	5,470,000	7,000	4,865	1,785	210	89 : 11
A. W.	2nd	5,000,000	15,400	13,182	1,232	986	55 : 45
W. T.	2nd	5,600,000 (101%)	14,000	10,052	2,324	1,484	61 : 39
T.W. R.	3rd	2,880,000 (49%)	9,000	7.560	1,224	216	85 : 15
Controls with Negative Serum Tests							
G. D.	(Obstructive jaundice)	4,928,000 (80%)	12,400	9,358	1,674	620	73 : 27
P. M.	(Catarrhal jaundice)	3,720,000	5,600	3,668	1,120	476	71 : 29
N. J.	(Hypertrophic biliary cirrhosis)	4,424,000 (60%)	5,800	3,800	1,800	200	90 : 10
E. T.	(Jaundice 8 yrs. ; br. pneumonia)	4,160,000 (70%)	8,600	6,020	2,193	215	88 : 12

TABLE III.—*Urine Examinations for Evidence of Leptospira*

Case	Direct Microscopy of Urine Deposit	Guinea-pig Inoculation
M. W.	9th week, negative	(i) Abortive experiment (ii) Two negative results
J. D.	4th week, negative	No illness, but leptospira found in animal's spleen
R. L.	8th day, positive	Slight malaise of animal after 8 days. No leptospira found
A. W.	14th day, positive	No experiment

In the other cases no examinations of urine for leptospira were made.

TABLE IV.—*Tests for Red-cell Fragility*

J. D. .. Diminished fragility ; haemolysis started at 0.38%.
D. H. J. .. Normal fragility.
W. T. .. Diminished fragility ; haemolysis started at 0.35%.

Fractional Gastric Analyses.—These gave the following results: J. D.: Achlorhydria. O. G.: Achlorhydria. G. J.: Hypochlorhydria.

TABLE V.—*Wassermann Reactions*

Case	Period of Illness	Blood Serum	Cerebrospinal Fluid
M. W.	7th week	Weak positive	Strongly positive to 1 : 5 dilution
	8th ,,	Very weak positive	
	11th ,,	Negative	
J. D.	10th ,,	,,	
	13th ,,	,,	
D. H. J.	6th ,,	,,	
R. L.	7th day	,,	
O. G.	14th ,,	Weak positive	Negative
	22nd ,,		
G. J.	15th ,,	Negative	" Pseudo "-positive
	23rd ,,		
	198th ,,	,,	
A. W.	14th ,,	Positive	Positive
W. T.	14th ,,	Negative	Negative

In cases M. W., A. W., and W. T. the spinal fluids had pronounced pathological changes ; in O. G. and G. J. no abnormality except a slight yellow tinge ? due to bile.

TABLE VI.—*Animal Inoculation Experiments*

(These were intraperitoneal injections of guinea-pigs. No scarification experiments were made.)

Case	Day of Illness	Duration of Experiment in Days	Material Injected	Result	Serum of Animal Tested with Leptospira
M. W.	54th	40	Blood	Negative	
	90th	1	Urine	Abortive	
	94th	40	,,	Negative	
	96th	30	,,	,,	
J. D.	100th	29	,,	Positive	
D. H. J.	42nd	85	Blood	,,	Positive at 1 : 10
R. L.	7th	12	,,	,,	Positive at 1 : 30
	8th	56	Urine	,,	Positive at 1 : 3,000
	28th	36	,,	Negative	Negative
Mine-water 1 (*re* R. L.)		13	Concentrated deposit	,,	,,
Mine-water 2 (*re* R. L.)		13	,,	Positive	Positive at 1 : 100
O. G.	9th	32	Blood	Negative	Negative
G. J.	10th	30	,,	Positive	,,
A. W.	14th	63	,,	,,	

TABLE VII.—*Renal Condition*

Case	Period of Illness	Urea Clearance % of Normal	Blood Urea mg. per 100 c.cm.	Urine Protein	Microscopy
M. W.	7th week		171	0.6%	Pus, R.B.C., casts
	9th ,,	36	63	Trace	Pus, R.B.C., hyaline and granular casts
	10th ,,	44	57		
J. D.	14th ,,			,,	No casts
	16th ,,			,,	,,
D. H. J.	7th ,,		537		
R. L.	2nd ,,			,,	R.B.C. and casts
O. G.	2nd ,,		414		
	3rd ,,		63		
G. J.	2nd ,,		117		
	3rd ,,	45	84	,,	No R.B.C., few casts
	4th ,,		51		
A. W.	2nd ,,		474	0.2%	R.B.C., many casts
W. T.	8th day		192	Trace	R.B.C., pus and casts
	26th ,,		114		
	36th ,,		42	,,	Few R.B.C., many casts
T. W. R.	21st ,,		165	0.5%	R.B.C.
	23rd ,,		168		

TABLE VIII.—*Van den Bergh Reactions*

Case	Week of Illness	Bilirubin Units per c.cm.	
		Direct Reaction	Indirect Reaction
M. W.	6th	5.8	6
	8th	3	4
J. D.	9th	2	2
	14th	0	0.5
R. L.	2nd	18.6	19.4
	8th	2	2
O. G.	2nd	41.8	44
	3rd	16.8	18
G. J.	2nd	33.8	36
	29th	0	0.5
A. W.	2nd	42.4	44
W. T.	2nd	9.6	10.4
	3rd	15.4	16.2
	4th	3.2	4
	8th	Trace	1
T. W. R.	3rd	8.8	9
	4th	11.2	12

TABLE IX.—*Urine Bilirubin, Urobilinogen, and Urobilin*

Case	Week of Illness	Bilirubin	Urobilinogen	Urobilin
M. W.	6th	Plus	No excess	
	8th		" "	
J. D.	11th	Negative		
D. H. J.	7th	Uraemic, no urine available		
R. L.	2nd	Plus	No excess	Negative
O. G.	3rd		" "	"
A. W.	3rd	"	" "	"
W. T.	3rd	"	" "	"
T. W. R.	4th	"	" "	"

I have pleasure in acknowledging the ready collaboration of my colleagues, Drs. Esmond Rees and J. Lloyd Davies, and of Mr. Willard Maclean, the clinicians concerned with these patients. My thanks are also given to Mr. Leonard Snow, biochemical technician at the Beck Laboratory.

The detection of nitrous fumes is the subject of a further leaflet issued by the Department of Scientific and Industrial Research ("Methods for the Detection of Toxic Gases in Industry," Leaflet No. 5, H.M. Stationery Office, 3d.). The situations in which nitrous fumes may be encountered in dangerous concentrations include ammonium nitrate works, celluloid works, dyestuffs works, explosives works, nitric acid works, nitro-cellulose paint, lacquer, and leather cloth works, photographic film works, sulphuric acid works (chamber process). They are also encountered in electroplating, engraving, metal cleaning, and photogravure processes, and are formed during oxy-acetylene welding. Nitrous fumes are extremely dangerous on account of their insidious character. There may be, and generally are, no immediate effects, and therefore it is impossible to foretell the serious consequences that may result from inhalation. A workman, unaware that he has inhaled the fumes, continues at work, often remaining well until after he has returned home. Some hours later he becomes restless, with a dry cough and shortness of breath. These symptoms increase, accompanied by a frothy sputum tinged with blood. If appropriate treatment is not applied death follows from oedema of the lungs. Concentrations stronger than 1 in 10,000 are frequently fatal if breathed for more than a few minutes. A concentration dangerous to inhale for even a short time may be hardly noticeable, because no disagreeable symptoms may be produced. Hence any atmosphere in which nitrous fumes are noticeable, either by smell, irritation, or colour, should be regarded as dangerous. The chemical test described in the leaflet is sensitive enough to be readily capable of detecting a concentration of 1 part in 100,000.

EARLY DIAGNOSIS OF CONGENITAL DISLOCATION OF THE HIP

BY

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The purpose of this short paper is to call attention to the fact, not always remembered, that congenital dislocations of the hip can be diagnosed before walking is begun, and to stress the advantages that accrue to the patient from diagnosis at this early age. Unfortunately it is rare for the surgeon to see a case before the age of eighteen months or so, while far too many cases are not diagnosed till much later, when it is quite impossible for treatment, however skilful it be, to produce a result other than one which falls far short of perfection. It can be said without fear of contradiction that the earlier a case is diagnosed the simpler will be the treatment, the greater the chance of a permanent cure, and—a very important point—the more perfect will be the anatomical and functional result. The surgeon is not content with curing the dislocation; he wants to give the patient a hip which will be radiographically normal, or approximately so, and which, therefore, will stand the wear and tear of life like a normal joint.

The Need for Early Recognition

If the deformity is diagnosed when a child is still below 12 months of age it is not even necessary to do a forcible manipulative reduction under an anaesthetic: simple abduction, increased till extreme, and maintained for a few months, will effect a cure in something like 90 per cent. of the cases. After the age of 12 months reduction and a stable position for the limb can only be achieved by force, the percentage of cures is not so high, and even though the cases are treated before the end of the second year a proportion of the "cures" will show a definite departure from the normal anatomically. It is therefore highly desirable that the diagnosis be made before the child begins to stand and walk. This is not always easy, but it can and should be done. The difficulty of the task is increased by the comparative rarity of the condition in this country. In Northern Italy, where the deformity is relatively common, Putti (1933) has shown what can be achieved by educating practitioners, and even mothers, to keep a constant watch for the signs of an abnormal hip in the early months of life. There is no reason why we should not do something on these lines in this country. The main reason why rare but well-known conditions are not uncommonly missed is not that the diagnosis is necessarily very difficult, but that the correct diagnosis, because of its rarity, never enters the doctor's head.

What may attract a mother's attention to the leg or legs? To quote Putti (1929):

"The mother may have noticed some little asymmetry, something unusual in the shape, the outline, or the attitude of one limb. One limb seems to her shorter than the other; one of the feet turns outward; in separating the lower limbs she saw, or felt, that one went less easily than the other; she observed that one limb was held in a certain degree of flexion; or that if she tried to correct this flexion the child cried. It is just such small signs that make one suspect a dislocation, and which should induce one to have an *x*-ray examination."

Signs to Look For

Now what are the signs the doctor should look for in infants? Asymmetry of the groove between labium and thigh. A slight hollow below the centre of Poupart's ligament. Asymmetry of the creases so commonly seen in the skin and fat on the inner side of the thighs of infants. The gluteal fold may be less distinct than on the normal side. The hips of young infants of both sexes have the slender male contour. If one hip seems more prominent, the contour on this side being that of the female rather than the male, a dislocation should be suspected. Slight shortening of one leg may be noticed as the legs lie parallel and fully extended. If the hips and knees are flexed the knees are not on the same level (Perkins, 1928). One leg may be rolled out rather more than the other. The sex of the patient is of some significance, since, as is well known, congenital dislocation is far more common in females. In about a third of the cases the deformity is bilateral, and in these many of the above suggestive signs will not be apparent. In a bilateral case the breadth of the perineum is increased, and, if the child is not too fat, the thighs will not be in contact. If any of the above signs are present the doctor will naturally proceed to palpation of the hips. In a fat baby, with but a small degree of luxation, it may be difficult or impossible to be sure of displacement at the hip. Nevertheless an attempt should be made to decide the diagnosis by searching with the fingers for those signs which one can make out with ease in an older child.

In a unilateral case the trochanter is raised on the affected side. On palpating the front of the joint the resistance of the head of the femur is not felt. The fingers can be depressed into the joint to a degree impossible on the normal side. This apparent absence of the femoral head from its normal situation must be confirmed by feeling the head elsewhere. The head in congenital dislocations is always to be felt *in front* of the great trochanter, somewhere between this and the anterior superior spine. On rotating the femur outwards the displaced head becomes more obvious. An abnormal degree of freedom of movement, particularly as regards rotation of the femur, may also be noticed. Abduction, however, may be limited, but this is only marked in older children, particularly in bilateral cases. Telescopic movement may be made out, again more often in the older children, provided always that the child can be induced to relax. When a case is seen only after walking has begun—and this will be later than usual—the suggestive limp and Trendelenburg's sign will be present: both are indicative of instability of the hip, and both are particularly well seen in bilateral dislocations. Lordosis is only marked when both hips are affected.

Differential Diagnosis

With regard to differential diagnosis, a pathological dislocation is excluded by the history and the absence of a scar. Congenital maldevelopment of the limb without dislocation is excluded by the radiograph: gross deficiency in the formation of the upper part of the femur usually produces a greater degree of asymmetry than is ever seen with congenital dislocation of the hip. Coxa vara is excluded by feeling the femoral head in its correct position in the joint, and failing to feel it in an abnormal position. In every case in which there is the faintest suspicion of a dislocation or other developmental error a radiograph of the two hips should be taken without delay. Particular trouble should be taken to ensure that the two legs are in identical standard positions when the film is being exposed, while the " reading " of the film of a young infant calls for special care.

The radiographic signs in an infant are: (1) shelving of the upper portion of the acetabulum; (2) diminution in size of the ossific centre for the head, if these centres are visible at all; and (3) displacement of the femur outwards and upwards. The first is invariably present; the second naturally depends on the age of the child, and is of no help in a bilateral case, but is invaluable in a unilateral case when the heads are visible; the third may be definite and conclusive, but is not by any means always so. In a tiny baby with a minimal degree of displacement, particularly in the bilateral case, a definite decision on the point may be impossible. The condition in which the roof of the socket is shelving rather more than that on the opposite side, and the displacement of the femur is minimal or absent, has been termed a " pre-dislocation." It is wiser to treat such a case as a dislocation rather than run the risk of the imperfection of the joint being rediscovered in middle life when arthritic changes have developed in a subluxated hip.

In conclusion, I suggest that an effort should be made to get these cases under treatment at an earlier age than has been usual in the past by constantly looking for them in child welfare centres and elsewhere, and by sending to the radiologist every suspicious case. Once the diagnosis is made, the sooner the case is sent to an orthopaedic clinic the better.

REFERENCES

Perkins, G. (1928). *Lancet*, **1**, 648.
Putti, V. (1929). *J. Bone Jt. Surg.*, **11**, 798.
—— (1933). Ibid., **15**, 16.

PNEUMOCOCCAL PNEUMONIA, COMPLICATING PULMONARY TUBERCULOSIS, TREATED WITH M & B 693

BY

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In view of the recent interest aroused in the treatment of pneumococcal infections with the preparation M & B 693, the following notes of a patient with pulmonary tuberculosis who developed pneumococcal pneumonia and was treated with this drug may prove of some value.

Case Record

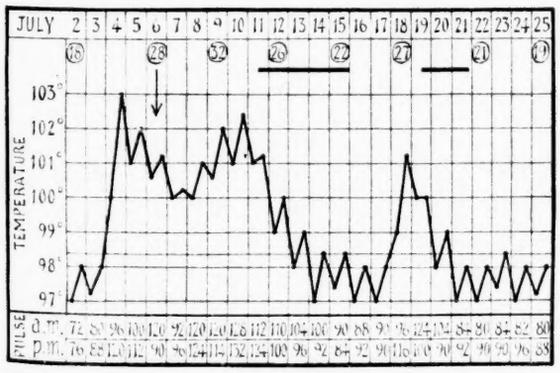
The patient was a man aged 22 who had suffered from pulmonary tuberculosis for three years. On admission to the sanatorium he was found to be suffering from bilateral disease, radiography of the chest revealing extensive fibro-caseous disease over the upper and mid zones on the right side, with scattered infiltration over the left lung and cavitation below the clavicle on this side. The sputum was heavily positive, and the sedimentation rate at the end of one hour (50 mm. tube) was 18.

Under routine treatment he made fair progress until the beginning of July, 1938, when he appeared to have contracted a chill. His temperature rose to 103° F., and next day physical examination revealed signs of consolidation of the right base. He had become dyspnoeic and his cough was increasingly troublesome. On the following day signs of a pleural effusion were found on the right side, and 18 oz. of greenish-yellow pus were aspirated. At this stage the leucocyte count was 12,400 per c.mm. and the sedimentation rate had increased to 28, a graph plotted at five-minute intervals showing a very rapid fall in the first half-hour. The

sputum was greenish yellow, and both pneumococci and tubercle bacilli were found. Meanwhile the pathological report on the fluid aspirated from the chest also indicated that pneumococci were present in the effusion, further investigation revealing that it was a Type II infection. Blood culture was negative.

Despite the usual routine treatment, supplemented by oxygen administration and cardiac stimulants, the patient's condition rapidly deteriorated, and by July 9 he was almost comatose. He was very cyanosed and toxic, and the sedimentation rate showed a further drop to 32. At this stage a supply of M & B 693 tablets was obtained, and a dosage of two tablets (1 gramme) given every four hours, with a total of 5 grammes daily. The next day his temperature had dropped from 101.2° to 99° F., and the pulse rate improved both in rate and force. Subsequently the temperature continued to show a steady fall (see chart), and the improvement in his condition was dramatic. After five days, the patient's temperature having now been normal for more than forty-eight hours and a total of 25 grammes of the preparation having been given, the drug was discontinued. But on the third day after the cessation of the tablets both temperature and pulse rate began to rise once more, and the patient was not so well. One gramme was therefore given at four-hourly intervals once more; but after three days the tablets were again discontinued, as the pulse and temperature were back to normal and the occurrence of toxic effects of the drug was feared. From this point he made a steady recovery and remained afebrile for another month, at the end of which time his sedimentation rate had improved to 15, and radiography of the chest revealed that except for thickened pleura over the lower half of the right lung, with obliteration of the costo-phrenic angle on this side, there appeared to have been no ill effects upon the lung tissue as a result of the pneumococcal infection and the subsequent effusion. The tuberculous lesion itself appeared to be much more fibrotic, and there was an absence of the fluffy, mottled shadows which had been noted on admission.

It should be added that pneumococci were still present in the sputum the day that treatment was begun with M & B 693, but that they could not be found on the third day and remained absent at each subsequent examination. The leucocyte count dropped from 12,000 to 7,600 per c.mm. on the fifth day of treatment with the tablets, but an increase in the red-cell count from 4,200,000 to 5,800,000 per c.mm. was noted.



Pulse and temperature chart showing effect of administration of M & B 693. The thick black lines indicate the period during which the preparation was given. The arrow indicates the aspiration of the chest which was performed. The figures within the circles indicate the blood sedimentation readings (Cutler technique).

Commentary

The development of pneumococcal pneumonia in the course of pulmonary tuberculosis is a comparatively rare occurrence and must be considered an ill omen. Although cases have been noted in which recovery from a genuine lobar pneumonia superimposed upon a tuberculous lesion has occurred, in the case described above the condition of the patient was so bad that it was not expected that he would live for many hours after the sixth day of his illness. No benefit was being obtained from routine treatment until M & B 693 was given, when a dramatic recovery followed.

The initial dosage was not high because we did not know what effect the presence of a tuberculous process in the lungs would have on the patient's response to the preparation, but no toxic effects at all were observed during the administration of the tablets, and in all probability higher doses could have been given with safety. The discontinuance of the drug after five days was apparently a little premature in this case, but the slight relapse which followed was easily controlled by further administrations of the tablets in the same dosage as before.

A further interesting point is that no increase in activity of the tuberculous disease occurred as a result of the infection, and that subsequent radiographic investigation of the chest revealed a definite improvement in the nature and extent of the lesion. The actual course of the pneumonic infection, and the patient's response to treatment, were clearly shown by the different blood sedimentation results during the course of the disease.

I have to express my thanks to Dr. J. B. McDougall for much helpful advice and for permission to publish this case, and to Messrs. May and Baker for a supply of the tablets M & B 693.

THE PROGNOSTIC SIGNIFICANCE OF OPHTHALMOSCOPIC FINDINGS IN CASES OF HIGH SYSTOLIC BLOOD PRESSURE

A REVIEW OF 83 CASES

BY

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High blood pressure is a common finding in the course of the routine examination of patients. It is usually regarded as a serious sign, and I think rightly so. But all cases are not equally serious, for numbers survive for years in a good state of health. It was to learn something about the outcome in such cases that the present investigation was undertaken, and particularly to discover whether or not the ophthalmoscopic examination might help in the differentiation of cases from a prognostic point of view. Eighty-three unselected cases have been followed up, the only standard for their inclusion in the series being a systolic blood pressure of 170 mm. Hg or over, as measured by the auscultatory method over the brachial artery. To have chosen the systolic pressure only is not to imply disregard of the importance of the diastolic pressure. This of itself is probably of more importance than the systolic pressure. But the diastolic pressure cannot be ascertained in a certain proportion of cases (Beaumont and Dodds, 1931), and it is not certain that all observers would agree as to its exact level in any given case. The systolic pressure is that upon which most clinicians base a diagnosis of high blood pressure. For these reasons, therefore, and because in an investigation of this kind it is easier to refer cases to one criterion than to two, it was decided to make systolic pressure the standard. The cases have been under observation for periods of up to five years, the average being two and a half years. Two points were chosen for special observation: (1) the state of the retinal blood vessels and (2) the presence of deposits—namely, exudates and haemorrhages.

State of the Retinal Blood Vessels

The classical signs of arterial degeneration were present in varying degrees of severity in many of the cases—namely, burnished copper-wire appearance, tortuosity and irregular calibre of the arteries, and deflection and constriction of the veins at the arteriovenous crossings. Most observers agree that these signs are commonly found in such cases. In addition, however, two features were noticed which are not generally remarked upon: (1) A haze overlying the arteries at points, especially at the arteriovenous crossings, and obscuring the vessel wholly or partly: I have not seen this commented upon elsewhere. (2) Attenuation of the blood stream in the arteries to the point of complete obliteration in some cases and of reduction to a mere thread in others. This latter feature has, however, been recorded by a number of observers, but it does not seem to have received universal recognition. A decrease in the lumen of the arteries appears to be one of the essential changes in these cases, and, in my opinion, its degree is a valuable index of the stage to which arterial degeneration has progressed. An attempt has been made to grade the appearance of the retinal blood vessels according to the degree of abnormality present, thus:

First degree.—Copper-wire appearance of arteries only, or normal appearance.

Second degree.—Tortuosity of arteries. Deflection and constriction of veins at arteriovenous crossings.

Third degree.—Irregular and reduced calibre of arteries.

Fourth degree.—Haze overlying the arteries at points, and especially at arteriovenous crossings.

Fifth degree.—Marked attenuation of blood stream, causing thread-like appearance in one or more arteries.

As a general rule the characteristics of any particular degree are in addition to the characteristics of the preceding degrees, but this is not invariably so. Thus the fifth degree does not always include haziness, belonging to the fourth degree, or copper-wire appearance, belonging to the first degree. It was a matter of some doubt whether the fourth or the fifth degree was really the more severe, but I considered that the thread-like attenuation of the arteries presented in appearance the greater departure from normality.

The following table shows the incidence of death and of cerebral haemorrhage in each degree group, and also the average systolic blood pressure relative to each group.

Group	No. in Group	Deaths	Cerebral Haemorrhage	Average Systolic Blood Pressure
				mm.
First degree	18	—	—	190
Second ,,	26	—	—	205
Third ,,	22	—	2	209
Fourth ,,	9	1	4	221
Fifth ,,	8	2	7	229

A study of this table reveals a close relation between the degree of retinal arteriosclerosis and the incidence of deaths and of cerebral haemorrhage. Of those cases exhibiting fifth degree sclerosis seven-eighths developed signs of cerebral haemorrhage within the period of observation, with an average of two and a half years. The table also shows the relation which exists between the degree of sclerosis and the height of systolic blood pressure. Figures relating to the latter are, however, only averages, and the correspondence does not necessarily apply to each individual. The incidence of cerebral haemorrhage was worked out for individuals in the series having a systolic blood pressure of over 220 mm., and it was found to be nine out of twenty-eight—approximately one-third. These figures would appear to indicate that the degree of vascular degeneration as observed in the retinal blood vessels affords a much more accurate index of the gravity of a case than the systolic blood pressure of itself, and suggests that in cases of high systolic blood pressure those showing retinal arteriosclerosis of the fifth degree are the most liable to cerebral haemorrhage, and that they are likely to have a "stroke" within a period of about two and a half years.

Other observers, notably Brana and Radnai (1935), have made investigations similar to the above and with the same object in view. They describe three degrees of retinal arteriosclerosis, the first degree showing variations in the calibre of the arteries, the second showing more numerous variations with distinct narrowing of the arteries, and the third showing striking narrowing. They note a certain degree of correspondence between the systolic pressure and the gravity of the fundus changes. As regards prognosis their findings are based upon the observation of 100 cases, followed up over the course of one year, and these are: with normal fundus, life is not endangered; with second degree sclerosis, 60 per cent. of deaths; with third degree sclerosis, 100 per cent. of deaths. While these figures indicate a much greater mortality than that found in the present series, they bear out the same conclusion—namely, that the retinal blood-vessel changes afford a most valuable index to prognosis in cases of high blood pressure.

Bonnet and Bonamour (1936) state that "it is possible to tell the stage of evolution of the clinical condition of the patient"—that is, from the condition of the retinal vessels. The prognosis, they say, may be assessed from this, and they quote Dumas in support of the view that the prognosis does not depend upon the height of the blood pressure. Conclusions are based upon a study of 100 cases, but no figures are given. Foster Moore (1925) records fifty-two cases attended at Moorfields for symptoms dependent upon retinal arteriosclerosis, their condition being ascertained after seven years. Seventeen of these patients died of cerebral haemorrhage or thrombosis, and, in addition, six developed vascular lesions of the brain—that is, twenty-three out of fifty-two, or 44 per cent., had vascular lesions of the brain within seven years. In the present series, in the group representing the three most severe degrees of retinal arterial degeneration and comprising thirty-nine cases, thirteen (33.3 per cent.) had vascular lesions of the brain within the period of observation, the average of which is two and a half years.

Presence of Deposits in the Retina

EXUDATES

Twenty-two cases (26.5 per cent.) exhibited this feature. In twenty-one of these the exudates were of the nature of small white dots, discrete in all except one case, in which they were confluent. Characteristically these were circular in shape, and surrounded by a faint dark halo. They were aggregated in the macular area in all except two cases, in one of which they were scattered and in the other arranged round the central area of the fundus. In no instance was there a stellate or fan-shaped arrangement round the macula. In some cases the dots were thought to bear a topographical relationship to the terminal twigs of the retinal blood vessels. These

observations accord closely with the description given by Bonnet and Bonamour (1936), who mention the shaded edges, and also the relation to the terminal macular vessels. There is no doubt that these spots correspond also to the type described by Foster Moore (1925) as belonging to the picture of arteriosclerotic retinitis.

Three of the cases showing exudates—that is, one-seventh—developed signs of cerebral haemorrhage ; so that the presence of exudates would not appear to be of such serious prognostic significance as high systolic blood pressure by itself (one-third of the cases over 220 mm.), nor is it comparable to retinal arterial degeneration (seven-eighths of the fifth degree group). The urine was examined in nineteen cases having exudates. Albumin was present in three cases only. There was a reduction of Fehling's in one case. Of the remaining cases not showing retinitis forty-four had the urine examined, and albumin was present in eight. There was a reduction of Fehling's in two cases. This type of retinitis would appear, therefore, to be independent of the presence or absence of albuminuria or glycosuria.

It is interesting to note that none of the cases showed the type of retinitis usually associated with renal disease—namely, star figure at the macula, cotton-wool patches, etc.—or the type usually associated with diabetes mellitus ; for it is argued by some that these types of retinitis are an outcome of the high blood pressure only and not of the associated disease. Here we have a series of eighty-three cases of high blood pressure not one of which showed the classical signs of renal or diabetic retinitis. This does not, of course, argue that high blood pressure has no influence in the production of these types of retinitis ; but it does argue that it is not the sole cause. It may be said of the type of retinal exudate under consideration that it points to the probable existence of high blood pressure but that of itself it has little prognostic significance.

RETINAL HAEMORRHAGES

These were noted in six cases. They seem to bear little relation to the height of the systolic blood pressure and do not of themselves appear to be of serious import. None of the six patients exhibiting the sign died or was the subject of cerebral haemorrhage.

Conclusion

The chief conclusion to be drawn from this study is that in cases of high systolic blood pressure the retinal arteries provide a reliable index of the state of the cerebral arteries and furnish an accurate means of foretelling which cases are most liable to vascular accidents of the brain. It confirms the time-honoured adage that a man is as old as his arteries, and suggests that the best means of ascertaining the age of his arteries is to inspect those accessible to direct vision in the fundus oculi.

REFERENCES

Beaumont, G. E., and Dodds, E. C. (1931). *Recent Advances in Medicine*, 6th ed., p. 265, London.
Bonnet, P., and Bonamour, G. (1936). *J. Méd. Lyon*, **17**, 197.
Brana, J., and Radnai, P. (1935). *Wien. Arch. inn. Med.*, **27**, 371.
Moore, R. Foster (1925). *Medical Ophthalmology*, 2nd ed., pp. 62 and 65, London.

At the French Colonial Office an advisory committee on trypanosomiasis has recently been appointed with the task of studying this disease from every aspect and proposing any remedy which may be useful. Its fourteen members are appointed by the Colonial Minister.

A CLINICO-PATHOLOGICAL CLASSIFICATION OF CANCER OF THE BREAST

BY

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Reference to the literature concerning the late results in the treatment of carcinoma of the breast has revealed an urgent need for the adoption of a uniform system of classification of patients according to the stage of the disease at the time of treatment. When a careful study is made of the statistics from various clinics it is obvious that different methods have been used in the classification of cases. It is true that in many papers no attempt has been made to classify according to the extent of the disease, and early and advanced cases have been considered together. While such figures are of interest as showing the fate of a large number of patients, no indication is given of the value of the several methods of treatment adopted. With the continued evolution of treatment in carcinoma of the breast and the development of irradiation methods, either alone or in conjunction with excisional procedures, it has become necessary to compare the end-results accruing from each method in order that still further advance may be made. For the appraisal of these techniques it is essential that comparable groups of cases according to the extent of the disease should be considered. The value of such a classification in carcinoma of the breast is exemplified by what has been achieved in carcinoma of the cervix uteri. When irradiation began to be used in the treatment of that disease it became apparent that the end-results must be compared with those obtained by excisional methods. As a result a classification was evolved whereby the results of each method of treatment could be compared in the same stage of the disease. With further knowledge concerning the life history of carcinoma of the cervix uteri certain modifications in the classification have been made, and now in many countries in Europe a uniform method is used, so that it is a safe and easy matter to compare not only the results obtained from various clinics in one country but the results obtained in each country.

The Need for Uniform Classification

Up to the present no uniform classification has been adopted for cases of carcinoma of the breast. If such a plan were adopted by clinics much useful information would come to light concerning prognosis in this disease and the relative values of the various therapeutic measures carried out. Further, there would be greater uniformity in the publications relating to treatment. As a result of work carried out in the follow-up departments of St. Bartholomew's Hospital and of the Royal Cancer Hospital (Free), I have evolved a classification based upon a correlation of the interrelated clinical and pathological aspects of cancer of the breast. Many attempts have been made to evolve a satisfactory system of classification both on clinical and on pathological grounds. Steinthal (1905) published a method which has received wide attention. This classification is as follows. Stage I: Slowly growing tumour, only a few centimetres in diameter, confined to the breast ; no attachment to skin ; the axillary nodes are few in number and are first discovered at operation. Stage II: A tumour which, after remaining stationary for some time, begins to increase in size ; there is attach-

ment to skin; the axillary nodes are demonstrable. Stage III: A large part of the breast is involved and the skin and underlying structures are invaded; the supraclavicular nodes are often involved. There are certain criticisms which depreciate the value of Steinthal's classification. In Stage I are "slowly growing tumours," but it is very difficult to determine accurately the rate of growth in cancer of the breast, and in the earliest cases a history of several weeks may be given during which the patient has not detected any appreciable change in the size of the growth. Secondly, even though axillary lymph nodes are first discovered at operation, on subsequent microscopical examination metastases may be found, and such patients must not be included among Stage I cases as the prognosis is very much worse once the disease has spread to the regional lymph nodes. The classification adopted in Stage II is also difficult to adapt on account of the rate-of-growth factor and because of the uncertainty of involvement of axillary lymph nodes without microscopical examination. Portmann (1937) has evolved a classification on a clinico-pathological basis, but there are many important factors in this classification which are omitted. Scarff and Handley (1938), in a careful study reported recently, call attention to certain important points in assessing the prognosis in carcinoma of the breast. They have stated that the prognosis can be correlated with the histology of the tumour and with the condition of the axillary lymph nodes.

Requirements for Satisfactory Classification

A satisfactory classification of carcinoma of the breast must embrace the following clinico-pathological findings.

1. *The Local Condition.*—(*a*) The involvement or not of the skin. If the skin is involved, is there: (i) early attachment, (ii) peau d'orange, (iii) ulceration? (*b*) The involvement or not of the pectoralis fascia. (*c*) The involvement or not of the pectoralis major muscle. (*d*) The involvement or not of the underlying rib, costal cartilage, or sternum.

2. *The Regional Lymph Nodes.*—(*a*) The involvement or not of the axillary lymph nodes according to group: (i) beneath the lower border of the pectoralis major muscle; (ii) beneath the terminal portion of the pectoralis major muscle; (iii) beneath the tendon of the pectoralis minor muscle. (*b*) The involvement or not of the axillary perinodal connective tissue. (*c*) The involvement or not of the supraclavicular lymph nodes. (*d*) The involvement or not of the mediastinal lymph nodes.

3. *Distant Structures.*—(*a*) The involvement or not of viscera. (*b*) The involvement or not of bone.

Up to the present cases of carcinoma of the breast have been classified into groups according to certain gross clinical findings. No account has been taken of the detailed spread of carcinoma in its various phases which must markedly influence the prognosis. It is obvious that the three conditions described regarding involvement of the skin must exert an important influence on prognosis, which, for example, is better in those cases with early attachment than in those with peau d'orange or ulceration. Again, the involvement of the perinodal axillary connective tissue appears to have been neglected in assessing the prognosis. It is obvious that this must be more grave when the carcinoma has transgressed the capsules of the lymph nodes. The actual lymph nodes which are involved in the axilla exert an influence on the prognosis which has not yet received attention. Thus the prognosis is worse in cases in which the lymph nodes at the apex of the axilla, under cover of the tendon of the pectoralis minor muscle, are involved, than in cases in which the lymph nodes low in the axilla under the lower border of the pectoralis major muscle are alone affected.

The Proposed Classification

The proposed classification based on clinico-pathological findings correlates the condition in the breast itself with the condition of the contents of the axilla and other more distant regions of the body which may be the sites of metastases. The stage of the disease in the breast is indicated by a number (for example, I) and the stage of the disease in the regional lymph nodes is indicated by a letter (for example, a); if the disease has spread to the perinodal connective tissues a dash (′) is placed after the letter (for example, a′); if the disease has spread to other organs of the body, then the first two letters of the organ or organs involved are added (for example, lu—lung; li—liver). The final stage of the disease is settled when these various regions have been considered and assessed, and the symbols are then combined (for example, I a′ lu).

THE ASSESSMENT OF THE STAGE OF THE DISEASE IN THE BREAST

Stage I Definition.—The carcinoma is strictly confined to the breast.

Stage II Definition.—The carcinoma infiltrates the skin (Stage II skin). The carcinoma infiltrates the pectoralis fascia (Stage II fascia).

Stage III Definition.—The carcinoma infiltrates the pectoralis muscle (Stage III muscle). The carcinoma ulcerates through the skin (Stage III ulcer).

Stage IV Definition.—The carcinoma infiltrates the ribs or costal cartilage or sternum (Stage IV bone). The carcinoma infiltrates the whole breast with peau d'orange of skin, and/or infiltration of underlying pectoralis fascia and muscle (Stage IV whole breast).

THE ASSESSMENT OF THE STAGE OF DISEASE IN THE REGIONAL LYMPH NODES AND PERINODAL CONNECTIVE TISSUES

Stage *a* Definition.—The carcinoma involves the lymph nodes under the lower border of the pectoralis major muscle.

Stage *b* Definition.—The carcinoma involves the lymph nodes under the tendon of insertion of the pectoralis major muscle.

Stage *c* Definition.—The carcinoma involves the lymph nodes under the tendon of the pectoralis minor muscle.

Stage *d* Definition.—The carcinoma involves the supraclavicular lymph nodes.

Stage *e* Definition.—The carcinoma involves the mediastinal lymph nodes.

If the carcinoma has transgressed into the perinodal connective tissue the symbol ′ is placed opposite the appropriate group of lymph nodes affected, in this way—a′, d′, etc.

Examples of Classification

1. Case: Carcinoma of the breast which infiltrates the pectoralis major muscle. There are metastases in the lymph nodes under the lower border of the pectoralis major muscle and the carcinoma has spread to the perinodal connective tissue (Classification = III (muscle) a′).

2. Case: Carcinoma infiltrates the whole breast with peau d'orange of skin and infiltration of the pectoralis major muscle. The lymph nodes under the lower border of the pectoralis major muscle and the lymph nodes under

the tendon of the pectoralis minor muscle are involved. There are metastases in the lungs (Classification = IV (whole breast) a, c, lu).

Conclusion

In order to establish this classification it is essential that careful clinical and pathological investigations shall be carried out in each case. After operation the specimen should, in the first place, be examined macroscopically and each structure identified, and orientation should be established in connexion with the contents of the axilla. A microscopical survey of the specimen should then be carried out according to the details described in the classification.

Summary

A new classification, which is based on clinico-pathological findings, is described for carcinoma of the breast.

A plea is made for the adoption of a uniform system of classification in order to increase our knowledge of the factors which influence prognosis in this disease and to facilitate comparison of the various methods of treatment in comparable series of cases.

BIBLIOGRAPHY

League of Nations Health Organization Atlas (1938). *Cancer of Cervix*, Stockholm.
Portmann, U. V. (1937). *Radiology*, **29**, 391.
Scarff, R. W., and Handley, R. S. (1938). *Lancet*, **2**, 582.
Steinthal, C. F. (1905). *Beitr. klin. Chir.*, **47**, 226.

Clinical Memoranda

Acute Primary Intussusception of the Jejunum

The following is the history of a case of acute primary intussusception of the jejunum with unusual features:

CASE RECORD

An unemployed miner aged 58 was admitted to the Victoria Hospital, Worksop, on September 17, 1938, because of excessive vomiting and abdominal pain. His own doctor had found no abdominal tenderness or rigidity, and a normal pulse and temperature; his bowels had not been open for three days. His doctor prescribed a bismuth mixture. The next day his wife reported to the doctor that the patient had been vomiting all night, and he was admitted to hospital.

Previous Personal History.—The patient had undergone appendicectomy eleven years before. Up to eight years ago he had always suffered from indigestion, and a gastrojejunostomy was performed for a reputed duodenal ulcer. Since the latter operation he had been in very good health and had had no occasion to consult a doctor.

Examination.—The patient looked dehydrated. Pulse 84, temperature 97.4°. No rigidity or tenderness, but some dullness over the left side of the abdomen. He vomited small amounts of bilious fluid, which had a faecal odour. He was seen at 3 p.m., and, as it was considered that all might not be well with the gastro-enterostomy, it was decided to observe him a little longer. An enema was given, with a very good result. In a few hours, however, his condition markedly deteriorated and his pulse went up to 110. He broke out in a cold sweat, with anxious, drawn facies, and complained of paroxysmal abdominal pains, referred to the umbilicus. The vomiting was not so severe; his abdomen was quite hollow. It was considered that he had a high intestinal obstruction; and a retrograde intussusception of the jejunum through the gastro-enterostomy stoma, or an internal hernia, was regarded as the probable cause. A stomach tube was passed and his stomach washed out with saline. The tube was left in position and an intravenous saline drip (40 drops a minute) begun. Both these measures were continued during the operation and for forty-eight hours afterwards.

Operation.—The abdomen was opened under gas-and-oxygen through the old median epigastric incision, which had been previously infiltrated by 1 per cent. novocain. There was a singular absence of adhesions, and the great omentum was very short. No free fluid was present. The posterior no-loop gastro-enterostomy stoma was examined and was found quite normal; nothing could be palpated in the lesser sac. The stomach was small and the pylorus thickened and stenosed. No ulcer was observed. The efferent jejunal loop appeared normal, but, on following it down, it led towards the left side, where a large swelling of the bowel was observed that on first appearance looked like a volvulus. It was delivered, however, quite easily through the wound and was found to be an intussusception of the small intestine. The apex was about thirty inches from the stoma, and was directed proximally—that is, it was retrograde. Gentle pressure with a hot cloth on the apex, combined with judicious traction distally, caused it to reduce easily. When this was accomplished, however, it was apparent that another intussusception, the apex of which was directed distally, was present. This was just as easily reduced by pressure on the apex towards the stomach, only to show up a third intussusception, again retrograde or ascending, like the first, and on reducing this a fourth descending intussusception was revealed. When this was reduced the continuity of the bowel was restored. The diagram roughly indicates the findings.

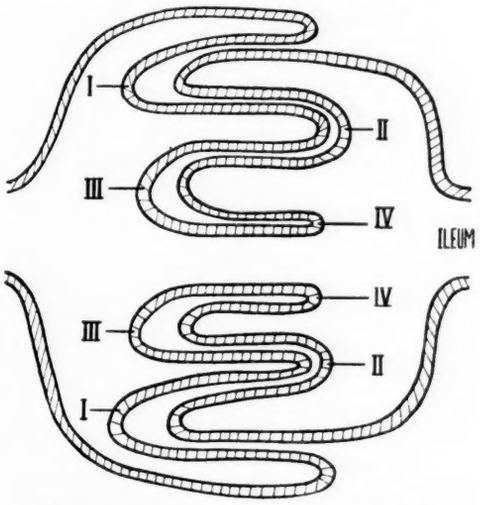

Diagram showing mode of intussusception.

Beyond the quadruple intussusception the bowel appeared normal. No adhesions were found, and the bowel regained a good colour on the application of hot cloths to the twenty-four inches involved. It soon contracted well, although very cyanosed and oedematous. No gangrenous patches were present and no thrombosis was observed in the mesentery, which was also infiltrated with oedema. A rapid palpation of the bowel and the general survey showed no evidence of any pathological condition in the intestines. Nothing could be found to account for the intussusception, which appeared to be absolutely primary and unrelated to the posterior gastro-enterostomy stoma. There was no evidence of purpura. A pint of saline was put into the peritoneal cavity and the abdomen closed without drainage. The patient was very comfortable when he recovered from the anaesthetic and had a good night with the aid of morphine. Next morning his pulse was 86, and he greatly appreciated the stomach tube. The stomach was washed out periodically and plain water left in. All fluid was measured. At the end of forty-eight hours his pulse and temperature were normal and he was very comfortable. The stomach tube was removed and the saline drip discontinued. On the third day he was a little distended, but an enema produced a fair result and much flatus. On the fourth post-operative day he was a bit chesty and was coughing. Pulse and temperature were still normal,

and no anxiety was felt for the patient. On the fifth day he died suddenly, and, as the case presented many unusual features, permission was obtained for a necropsy.

Post-operatively the Kahn test was negative; the red blood corpuscles showed normal fragility, and the blood count gave: haemoglobin, 72 per cent.; 5,200 white cells, 5,396,000 red cells, and a colour index of 0.67.

Post-mortem Report.—Nothing particularly of note was found in the heart, liver, kidneys, and spleen. The stomach was normal, but a contracted pylorus barely admitted the tip of the little finger. The jejunum had a passively congested area extending for twenty-four inches and starting twenty-four inches below the stoma of the gastro-enterostomy; the mesentery of this congested area showed similar congestion to a depth of one inch from the bowel attachment. The left lung was normal, but the right lung revealed lobar pneumonia affecting the middle and lower lobes.

The cause of death was lobar pneumonia. There was nothing to suggest a reason for the intussusception, either in or about the jejunum. The adhesions were limited in extent to the immediate area about the stoma.

COMMENTARY

Hamilton Drummond, discussing retrograde intussusception after gastro-enterostomy, assumes that the latter is in some way responsible for the invagination. He suggests that it is due to the stomach emptying more rapidly than normal, and "its acid contents causing some irritation of the upper jejunum." Thus, violent anti-peristaltic movements are set up, and the non-sphincteric stoma allows the intestine to enter the stomach, where the negative pressure created by vomiting keeps sucking in more and more.

This explanation, however, does not satisfy us as being applicable to our own case. Riedel, quoted by Drummond (1923–4), records a case of ascending intussusception of the colon some distance above a descending intussusception, and this is the nearest approach to our case that we can find. Thirty inches of normal jejunum intervened between the stoma and the apex of the intussusception in our case, and with the compound "to-and-fro" type of invagination described it would appear inconceivable that it could ever reach the stoma. At the same time we feel that the short-circuit may be related in some indirect fashion to the development of the intussusception. A probable explanation on modern lines might postulate an intense segmental contraction of the jejunum in response to some irritant passing rapidly from the stomach, or variations in intra-intestinal pressure. This localized constriction upsets the delicate neuromuscular co-ordination, and causes a degree of imbalance between the sympathetic (inhibitory) and the parasympathetic (motor) nerves. In the game of "see-saw" which ensued the complex intussusception was produced, the first and third invaginations being descending, or peristaltic, and the second and fourth being ascending, or anti-peristaltic.

We desire to express our thanks to Dr. Gavin A. Dunlop for the pathological report; to Dr. R. Wynn-Jones for an excellent gas-and-oxygen anaesthesia; and to Dr. van Vleet, the patient's own doctor, for the details of his previous history.

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BIBLIOGRAPHY

Bailey, Hamilton (1938). *Emergency Surgery*, 3rd ed., p. 260.
Choyce, C. C. (1932). *System of Surgery*, 2nd ed., **2**, 497.
Drummond, Hamilton (1923–4). *Brit. J. Surg.*, **11**, 79.
Hinton, J. W. (1926). *Ann. Surg.*, **84**, 100.
Illingworth, C. F. W., and Dick, B. M. (1935). *Surgical Pathology*, 2nd ed., p. 484.
Turner, G. Grey (1934). *Modern Operative Surgery*, 2nd. ed., **1**, 726.

Reviews

SURGICAL TECHNIQUE

Modern Surgical Technic. By Max Thorek, M.D. With a Foreword by Donald C. Balfour, M.D., LL.D., F.A.C.S., F.R.A.C.S. Three volumes. (Pp. 2,043; 2,174 figures. £7 10s. net for three volumes.) London: J. B. Lippincott. 1938.

In his foreword Dr. Donald Balfour of the Mayo Clinic emphasizes the importance of the art of surgery and reminds us that this may be obscured by the necessary concentration on the physiological, pathological, and biochemical problems relating to the surgical case. There can be no doubt that successful surgery depends upon attention to detail and that there is a field for really good works on modern operative procedures. The author tells us that the present textbook in three volumes is intended for students, general surgeons, and those general practitioners who are occasionally called upon to perform emergency operations. The work has three good features: first, it is lavishly illustrated—on the principle, we are told, that the Chinese say that "one picture is worth a thousand words"; secondly, operations are described by the step-by-step method; and, lastly, the text is clearly printed and easily readable. Having made this general statement, however, we can find little to be enthusiastic about in this very ambitious attempt on the part of a single surgeon to cover the wide field of surgery in all its branches. Much is out of date, and an occasional surgeon may be led into difficult and dangerous paths if he depends upon it. This applies particularly to the surgery of the brain, and as an instance we may cite trigeminal neuralgia. Operations are depicted on the peripheral branches of the Gasserian ganglion, and a detailed description given of the removal of the ganglion itself, which from the accompanying illustration would appear to be a very simple and straightforward procedure. There is no mention of the highly successful and widely practised operation of retrogasserian neurotomy, which has replaced the difficult and dangerous Gasserian extirpation here advocated and the futile avulsion operations on its peripheral branches. This is the more surprising when one remembers that the retrogasserian operation was developed by Frazier in America and is now the established procedure in neurosurgical clinics there as well as in this country and elsewhere. The statement that when injection or neurectomy fails to be followed by relief the Gasserian ganglion should be removed is in our opinion misleading and dangerous. This example of the treatment of trigeminal neuralgia is typical of what occurs throughout the work: obsolete procedures are interspersed with some well-illustrated and well-balanced accounts of operations about which there can be no dispute. There is, for example, an excellent brief account of the surgery of the pulmonary artery. Such a mixture must be almost inevitable in a one-man production which includes ophthalmic, ear, nose, and throat, gynaecological, and orthopaedic as well as the other special branches of surgery, and this is the chief criticism of this work.

Volume I deals with general considerations, anaesthesia, and the surgery of the head and neck; Volume II with surgery of the nerves, vessels, and bones, and of the breast and chest; Volume III with the abdomen and the pelvis. Where the good is mixed with the bad the danger is that the young graduate and inexperienced surgeon may not be able to discriminate. We believe that the

time has passed for the one-man volume on technique covering the whole field of surgery, and that only by contributions from those who are constantly at work in particular fields can a really modern volume on the whole of surgical technique be produced—a plan followed, for example, by the late H. W. Carson and since maintained in the excellent work on operative surgery which is known after him.

GENERAL SURGERY, 1938

The 1938 Year Book of General Surgery. Edited by Evarts A. Graham, A.B., M.D. (Pp. 781; 313 figures. Coloured frontispiece. 3 dollars; 12s. 6d., postage 6d.) Chicago: Year Book Publishers; London: H. K. Lewis. 1938.

The 1938 *Year Book of General Surgery*, like its predecessors, covers a wider field than some might assume from the title, for sections on orthopaedic, thoracic, and neurological surgery find a place, as well as those concerned with what is usually regarded as general surgery. The book has an essentially practical character, and, as might be expected and as an indication that this aspect is prominent in the minds of compilers of such yearly reviews, we find that certain of the papers here abstracted and illustrated are familiar as those which are also chosen by the editors of our *Medical Annual* as worthy of reproduction. Editorial comments are in small type and make interesting reading. Thus in reference to a statement (p. 425) in favour of using a Murphy button after an intestinal resection near the duodeno-jejunal junction we read: "The fact that the author was a former house-surgeon of Dr. Murphy may account for the partiality.—ED."; and after a reference to a paper on lingual goitre (p. 196): "The danger of the development of myxoedema after the removal of a lingual goitre has been common knowledge in America for many years.—ED." The distinguished position which the editor holds in the fields of thoracic surgery and the surgery of the gall-bladder makes these sections particularly interesting. We should like to have seen some reference to the importance of dehydration in head injuries, a form of treatment which has been responsible for vastly better results in recent times, and which has been emphasized in several papers during the past two years. Taken as a whole, however, the volume for 1938 covers well the year's contributions to the subject.

DISEASES OF THE OESOPHAGUS

Les Maladies de l'Œsophage. By J. Terracol. (Pp. 664; 352 figures. 190 fr.; bound, 220 fr.) Paris: Masson et Cie. 1938.

In producing a magnum opus upon diseases of the oesophagus Professor Terracol of Montpellier has called to his aid a formidable array of well-known writers. Without giving a complete list the names of Belinoff, Delmas, Despons, Guns, Haslinger, Mounier-Kuhn, Sargnon, and Worms may be mentioned. The arrangement of the book follows conventional lines, and everything relating to the anatomy, physiology, examination, and surgery of the oesophagus will be found in its proper place. Injuries and diseases are naturally fully described. Among the sections which seem to be of special merit are those on anatomy, on the rarer forms of oesophageal disease, and the admirable account of cancer of the oesophagus. As the editor has endeavoured to make his book totally comprehensive it is perhaps not hypercritical to suggest that some account of the comparative anatomy of the oesophagus might have been included, especially as the anatomical description by Delmas and Terracol is so clearly written and illustrated; but with this possible exception there is no other notable omission.

It will be found throughout how the work of the great masters and pioneers is freely acknowledged and influences the writing and teaching of those whose lot it is to carry forward the same task at the present day. Mikulicz, Killian, Moure, and especially Chevalier Jackson are among these pioneers, and this foundation gives a sense of real value and permanence to a book which, though a compilation, is no hasty compilation, but a complete and modern exposition upon an organ which presents every possible difficulty to the clinician both in diagnosis and in treatment.

The book is freely illustrated with drawings of anatomical and pathological specimens, with radiographs, and with endoscopic views, so that the illustrations alone provide an education both on the subject and on the manner in which such a work should be produced.

MEDICO-LEGAL SCIENCE

Recent Advances in Forensic Medicine. By Sydney Smith, M.D., F.R.C.P.Ed., D.P.H., and John Glaister, M.D., D.Sc. Second edition. (Pp. 264; 85 figures. 15s.) London: J. and A. Churchill. 1938.

This remarkable little volume contains the latest discoveries and methods in a surprisingly large number of departments of medico-legal science. The two authors, who are professors of forensic medicine in Edinburgh and Glasgow respectively, have summarized most of the recent work on blood grouping and describe in some detail the importance of the M and N factors. It is, however, a little difficult to see why they have set out in the chapter on blood groups so much that is familiar and has been constantly repeated in numberless articles and textbooks, including their own standard works. Professor Moritz has written a chapter on the cuticular structure of hair, a simplified technique for taking hair casts, and a note on flat impressions of bullets. The examination of projectiles and cartridge cases, to which Professor Sydney Smith has devoted much study, is, of course, treated very fully, and contains much concise and accurate information and advice. Dr. A. G. Mearns contributes a study on larval infestation and putrefaction. The authors have given greater prominence than in their last edition to the estimation of blood alcohol and the interpretation of the results, and have extended the section on the use of the spectrograph. The illustrations are well chosen and excellently reproduced; they include photomicrographs of many different types of hair, and photographs of chemical propellants, bullets, and apparatus. The authors also give interesting data on recent methods of forgery detection by invisible light. This book should be in the hands of every police department in the country.

MANHOOD IN THE MAKING

Manhood in the Making. Edited by T. F. Coade, M.A., Headmaster of Bryanston School. (Pp. 347. 10s. 6d. net.) London: Peter Davies. 1939.

In *Manhood in the Making* the headmaster of one of our modern public schools presents a series of essays dealing with problems of education which are engaging attention to-day. The contributors are acknowledged authorities on the subjects selected, and we commend this book to all doctors with sons to educate or who are professionally associated with school life. If there is one conclusion arrived at more certain than any other, and a conclusion not directly in the mind of the contributors, it is that

education and the science of medicine are inseparably linked together, and it is in the strengthening of this bond that real advances can be anticipated.

Physical education, nutrition, and hygiene are first dealt with, and the conclusions arrived at are, as would be expected, along the lines laid down in the well-known B.M.A. reports on these subjects. Professor Mottram's survey of the latter subjects is simple and direct. If the reproach of an undue and preventable incidence of sickness in our boarding-schools is to be lifted it will only be by observance of the principles he lays down. These principles have been too long accepted in theory and neglected in practice. The interesting essay by Professor Cyril Burt on "Delinquent Tendencies in Adolescence" suggests that in the psychological field real advance in education is rapidly being achieved. The last chapter deals with vocational guidance. It is difficult to understand why this important aid to education is so little appreciated. The application of scientific methods in estimating a boy's aptitude is now well established, though the best moment to exercise it may be difficult to choose.

Among other essays all will read with pleasure and profit "The Well-stocked and Disciplined Mind" by Mr. Garton; some will be entertained and perhaps provoked by the essay on "Parents" by the headmaster of Summerhill School, and not a few (especially doctors) will think the case against co-education dismissed too lightly by Mr. Badley. The book contains an excellent bibliography in which we are not a little surprised to find no mention of the B.M.A. Report on Physical Education.

DISEASES OF DOMESTIC ANIMALS

Special Pathology and Therapeutics of the Diseases of Domestic Animals. By Dr. Franz Hutyra, Dr. Joseph Marek, and Dr. Rudolf Manninger. Fourth English Edition. Edited by J. Russell Greig, Ph.D., M.R.C.V.S., F.R.S.E., with the collaboration of J. R. Mohler, D.Sc., and Adolph Eichhorn, D.V.S. Volumes I, II, and III. (Pp. 2,410; 724 figures, 23 plates. £6 6s.) London: Baillière, Tindall and Cox. 1938.

This well-known work, now in its fourth English edition, has substantially the same lay-out as in previous editions. The first volume is devoted to the infectious diseases, the second and third volumes to diseases of the various organic systems. Many of the sections have been revised or completely rewritten. New chapters have been included on fowl typhoid, infective gastro-enteritis of cats, Rift Valley fever, vesicular stomatitis, blue tongue of cattle, tularaemia, trichomonas abortion of cattle, and theileriasis, among the infectious diseases. In the systemic diseases the section on the physiology and pathology of the ruminant's stomach has been revised, as also the sections on helminthic infestations of the alimentary tract and lungs. This list of revisions and additions is by no means exhaustive.

Nevertheless, despite the wide scope of the work one has a sense of disappointment at its shortcomings. Unfortunately the authors and editors have not taken the opportunity of remedying the defects of previous editions. The arrangement of the various diseases in the different sections is rather artificial. For instance we note that rabies is placed in the first volume under infectious diseases, whereas Borna disease and equine encephalomyelitis are placed in the third volume under diseases of the nervous system. The practice of constantly referring to authors by name without giving the date of publication or its source is continued in this edition. The bacteriology, particularly in the first volume, is unsatisfactory. The bacterial nomenclature, at least for English readers, is rather antiquated, and the illustrations of serological methods of diagnosis are misleading in their simplicity. In a work of this size it is inevitable that there will be omissions, but it is difficult to understand why a disease of such economic importance as streptococcal mastitis in cows is not described. In the section on paratyphoid infections the antigenic structure of the Salmonella group of bacteria deserves more than a brief mention. In a book which the authors hope will be of value to the worker in the field of comparative pathology, as well as to the practising veterinarian, the problem of neoplasia merits more than a list of the possible tumours that may occur in each organ. It is impossible to obtain any idea of the general incidence and distribution of neoplasia in the domestic animals from this work, quite apart from the mass of new knowledge gained by animal experimentation, which is not mentioned.

These defects appear to result at least in part from the conflicting aims of the book. As stated in the foreword these may be summarized, "giving on the one hand due weight to the aetiology, pathogenesis, and diagnosis of the individual diseases; on the other hand a sufficiently detailed account of methods of treatment." Symptoms and treatment seem to have had the best of the bargain.

Notes on Books

The First Five Years from Birth to School. How to Help your Child to Develop its Personality, by Dr. R. MACDONALD LADELL, is one of the Practical Psychology Handbooks published at 1s. from Manfield House, Southampton Street, London, W.C.2. The author seeks to guide mothers in the care of their young children. It is simply written and full of common sense—a plea, in fact, to let the child grow up naturally in the avoidance of unnecessary and fear-producing restrictions on the one hand and the attitude of so-called freedom from repressions (from the adult point of view) on the other. It is pointed out that this "freedom" is often not only unnecessary but not wanted by the child, leaving it with a sense of bewilderment without direction in the so-far uncharted ocean of life. Certainly this little book can be recommended.

Exercises in the Bath, by T. R. TONGA, with an introduction by Sir Leonard Hill, is published by Putnam and Co. at 5s. In this book the author describes certain exercises which he has devised with the object of undertaking them while immersed in an ordinary bath. He has remained in excellent health, and seems to attribute this entirely to his exercises. However this may be, the exercises do give good employment to practically all muscles, and movement in hot water is undoubtedly beneficial. Those who are interested in this subject will no doubt wish to study Mr. Tonga's methods.

A useful contribution to a somewhat neglected branch of medical knowledge is *Anatomia del Neonato,* by Professor FRANCESCO BELLELLI of Naples. This is a paper-bound monograph of over 200 pages containing over 100 illustrations. A great deal of research into the literature as well as careful study of anatomical material has obviously been undertaken, and paediatricians should find it useful as a work of reference—though many will be puzzled by Professor Giunio Salvi's preface. The monograph is published in Naples by *La Riforma Medica* at 30 lire.

Theatre Technique for Nurses and Students, by GLADYS SOLOMON, senior theatre sister at the Groote Schuur Hospital, Capetown, should, as Professor Charles Saint tells us in a foreword, be of benefit to nurses and students who may have to depend entirely on themselves for the efficient

carrying out of operative procedures away from routine hospital facilities. It consists of a hundred-odd pages, including illustrations which are chiefly of apparatus but are unnumbered as figures. It would seem unnecessarily confusing to the already overburdened nurse to attach personal names to nearly all the pieces of apparatus figured. Thus we see Meseux's vulsellum, Lewer's vulsellum, Fritch's abdominal retractor, Ferguson's bone-cutting forceps, etc., and the illustration of Lowman's bone and plate holding clamp might well be omitted from another edition. This is a minor criticism, however; the work is well compiled, full of very useful practical details—for example, the sterilization of a cystoscope, cleaning of instruments, contents of drums—and may be recommended to those for whom it is written. It is published at 8s. 6d. by Maskew Miller Ltd., Capetown.

Lehrbuch der Pharmakologie im Rahmen: einer allgemeinen Krankheitslehre für präktische Arzte und Studierende, by Dr. FRITZ EICHHOLTZ of Heidelberg (Berlin: Julius Springer, RM. 16.50; bound, RM. 18), treats the subject in an interesting and original manner. The book is divided into three parts: general pharmacology, pharmacology of the separate body functions, and chemotherapy. The first part deals with vitamins, endocrines, sera, vaccines, and non-specific protein therapy. The general principle adopted is first to describe the nature of the disorder of function which it is necessary to influence and then to give an account of the agents likely to produce the desired effect. The volume is well illustrated with 85 figures, and these have evidently been chosen with care; in addition, structural formulae are used freely. It is of interest to note the absence of lists of drugs with pharmacopoeial doses: instead of this the appropriate range of dosage of important drugs is discussed in the text. In general it may be said that the volume provides in an interesting form an account of the scientific basis of modern methods of therapy.

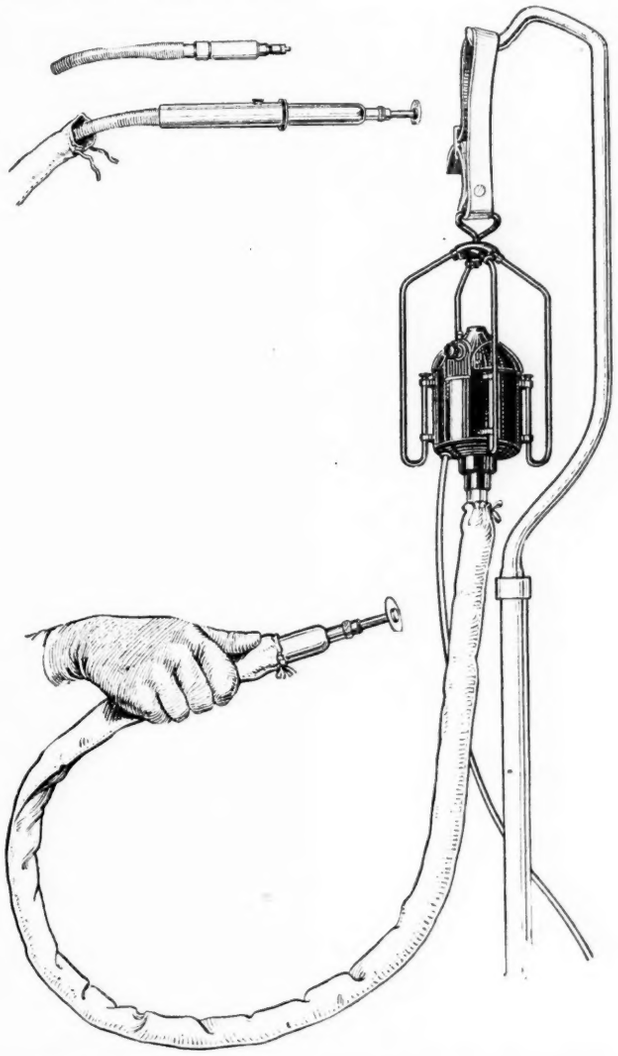
In a doctorate thesis at Uppsala G. F. OLSSON discusses experimental investigations on colour values in the central and paracentral areas of vision and deals exhaustively with the difficult problem of the effect of the macula yellow on colour perception. His conclusions are essentially negative, for he can find no support in the view that the undoubted differences between central and paracentral colour perception are attributable to the modifying influence of yellow. *Experimentelle Untersuchungen über Farbengleichungen* is published at Stockholm by Centraltryckeriet, Esselte Aktiebolag.

Preparations and Appliances

ELECTRICAL SURGICAL SAW

Mr. I. S. SMILLIE, F.R.C.S.Ed. (Orthopaedic Department, Royal Infirmary, Edinburgh), writes:

There are few surgeons who have not suffered the unfortunate experience of the breakdown of an electric saw at a most inopportune moment. The model illustrated combines extreme simplicity of design with efficiency in use of a degree sufficient to merit description. Based on a standard commercial universal motor of ¼ h.p., it has more power than is usually available and, being designed for continuous workshop use under full load, is hardly likely to be tested in the operating theatre. The motor is suspended from a saline stand, close to the operating table, and the power is transmitted to a chuck, which takes standard Albee pattern saws and drills, by a flexible shaft covered by a sterile cloth tube. Only two parts require sterilization—the chuck and the cloth tube. In preparing it for use the theatre sister holds the chuck and tightens the set-screw, while the unsterilized flexible shaft is engaged by an assistant. The cloth tube is then threaded on and the tapes tied distal to the flange, while the proximal tapes are secured close to the motor by the assistant. When a suitable saw has been selected the instrument is ready for use. A foot-switch, giving five speeds, provides control of the motor.



Apart from the advantages enumerated, it will be noted that: (1) there is only one plug-in electrical connexion—that connecting the motor to the power supply; (2) the portion of the chuck receiving the saw or drill shanks being sterile, the cutting tool may be changed during the operation without danger of infection; (3) the bearings of the motor are not subject to lateral thrust, a common fault in most types (the bearings of electric motors are not designed to be subjected to this particular stress, which leads to rapid wear and consequent vibration); (4) the friction inherent in the flexible shaft causes the saw to stop almost instantaneously when the current is cut off, which makes for safety in use; (5) the cost bears favourable comparison with other available types. This instrument was constructed for me by the Edinburgh Cutlery and Repair Company, 18, Buccleuch Street, Edinburgh, 8.

DESICCATED WHOLE-BILE CAPSULES

Desibyl capsules (Parke, Davis and Co.) contain desiccated whole bile (5 gr.). They are recommended for use as replacement therapy in cases of biliary fistulae. The makers provide a brochure which gives an account of the physiology and pathology of biliary secretion and also a summary of clinical evidence regarding the therapeutic results that follow administration of bile. Recent evidence indicates that adequate biliary secretion is essential for the absorption of vitamins A and D and for the normal absorption of calcium.

SURGERY IN ENGLAND IN THE MAKING

SIR ALFRED WEBB-JOHNSON'S ORATION

On March 15 Sir Alfred Webb-Johnson, surgeon to the Middlesex Hospital, delivered to the Royal Australasian College of Surgeons the Syme Oration, in memory of the first president of that college, the late Sir George Adlington Syme. His subject was the development of surgery—or, rather, of surgeons as a corporate body—in England. He added to the interest of the occasion by bringing certain gifts to his Australasian colleagues. First he asked the acceptance by the College of a portrait of Lister after the picture by W. W. Ouless, R.A., which hangs on the staircase of the building in Lincoln's Inn Fields. Having drawn the material for his oration largely from two authorities, Sidney Young's *Annals of the Barber Surgeons* and South's *Craft of Surgery*, he thought it appropriate to present both these works to his hosts. Young's book was hard to come by, but there was still one copy in possession of the publishers, and he brought it as a gift from the chairman of the Barbers Company, Lord Ebbisham, a former Lord Mayor of London. Another addition to the Australasian library which he brought was the volume prepared by Sir William MacCormac to celebrate the centenary of the Royal College of Surgeons of England. This particular copy was sent by Sir Cuthbert Wallace, past-president of the College, to whom it had been presented by the author. From a feeling of filial piety the orator added to the little pile the writings of Sir Charles Bell, founder of the Medical School of Middlesex Hospital.

The Origin of Charters

After a reference to the work of Syme, of whose great intellectual qualities, strength of character, and gift of leadership he could only speak from hearsay; Sir Alfred Webb-Johnson invited his audience to look backward, even as far as the Norman Conquest, and see something of the surgery of England in the making. It was a story, he said, of steady striving after the establishment of a corporate body with one great end in view—the advancement of surgery for the benefit of mankind. Under the Norman kings and early Plantagenets an organization of local government was set up in England, and boroughs were granted charters of incorporation. In some towns these charters included the right to have merchant guilds, to which were accorded the privilege of excluding strangers or interlopers. But the king sometimes granted a similar privilege to other bodies more or less in opposition to the merchant guilds. These were the craft guilds, originally fraternities of alien handicraftsmen, but presently ceasing to be restricted to aliens and becoming officially incorporated in the national life.

In these early Norman times there were two classes of men practising surgery, and each formed itself into a craft guild, which guilds became the cradle of surgery in its corporate expression. The first consisted of the military surgeons—the aristocracy of surgery—men who accompanied the kings and nobles on the crusades, and were in touch with schools of learning beyond the borders of their own land. In addition there were men of a "baser sort"—the barbers—who had been the assistants of priests, and when papal edicts prohibited the priests from practising surgery proceeded to practise it themselves.

The Guild of Surgeons was animated by the desire to improve the practice of surgery by ensuring a certain standard of qualification on the part of those entering upon such practice and the maintenance of a code of ethics. But its members were few, and often away at the wars. The Guild or Company of Barbers, on the other hand, had a large membership and a good organization, and its members stayed at home. It had the ear of the people, and secured certain vested rights, so that the Guild of Surgeons had to fight against considerable odds. But they continued their determined efforts for the improvement of the science or the art of surgery. It was through them that the modern surgeon traced his pedigree. It was not the barbers, as Sir James Paget pointed out, from whom surgeons had descended.

Privileges of the Barber Surgeons

When at length the Guild of Surgeons did secure the right to exercise control over the practice of surgery its success was brief. The barbers were still active, with enough influence to obtain ordinances affirming or reaffirming their rights. Even an alliance of the surgeons and the physicians in the reign of Henry VI, and the formation of "the first Conjoint Board"—a Faculty of Physicians and Surgeons with power to examine all who desired to practise surgery in London—failed to prevent the barbers from getting their privileges confirmed. Eventually the surgeons were completely checkmated by the grant of a royal charter to the Barbers Guild by Edward IV in 1461. It was clear that by this time the growing numbers and increasing civic power of the barbers had attracted many surgeons of position and reputation to their guild, and the first senior warden of the incorporated company was sergeant-surgeon to the king.

The Surgeons Guild continued as a separate body for nearly a century, but there was no longer a struggle between the rival fraternities; on the other hand, there was a constant effort among the better surgeons, whether in the Surgeons or the Barbers Guild, towards the improvement of the practice of surgery. With this in view the leading surgeons in both fraternities came closer together, and in the reign of Henry VII they struck up a voluntary alliance. The struggle closed with the union of the two bodies in 1540 by Act of Parliament. This association between the Guild of Surgeons and another incorporated body of surgeons who practised under the name of "Barbers" and were in conjunction with actual working barbers seemed grotesque to us, but Paget wrote that what was called a union was really only an official junction. Probably the better surgeons were not pleased with their housemates, but it was evident that the association was considered wise and expedient at the time by those who desired the improvement of surgical practice. The alliance with the physicians had lapsed, the surgeons themselves were divided between the two fraternities, and the Barbers Company was unassailably entrenched behind its royal charter. Thus it might well have seemed that by union alone could the better surgeons attain their ends.

The Act of Union

The orator showed a reproduction of the masterpiece by Holbein of Henry VIII handing the act of union to the Master of the Surgeons and Barbers.* The king is shown supported by his physicians, John Chambré, who attended at the birth of Elizabeth and Edward VI, and William Butts, whose intervention on behalf of Archbishop Cranmer is immortalized in Shakespeare's *Henry VIII*, and on the other side is Thomas Vicary, the king's sergeant-surgeon, one time Master of the Barbers and first Master of the united company—a great figure at St. Bartholomew's Hospital.

The orator next mentioned a few of the surgeons whose names stood out in history before the union: Master John of Arderne, a contemporary of Chaucer, who taught that wounds should be dressed as seldom as possible, and Thomas Morstede, who served with Henry V in the campaign which ended at Agincourt, among others.

The association of surgeons and barbers, fantastic as it seemed to-day, lasted for a couple of centuries in spite

* Holbein's picture hangs in Barbers Hall. There is another representation in the entrance hall of the Royal College of Surgeons, by some thought to be made up of original sketches by Holbein from the life. There are differences in detail between the two pictures.

of continual strife between sections of members in the united company and a determined effort to effect a separation by petition to Charles II. Teaching assumed a place in the activities of the company, for which purpose Inigo Jones designed a theatre to be added to the hall. The company had certain exclusive rights in regard to teaching, and when two of the hospitals also began systematically to carry on teaching complaint was made "against breeding soe many Illiterate and unskilful pretenders to Chyrurgery at St. Thomas's." Disciplinary action was taken by the company against those who taught anatomy and dissected in their own houses; yet in fact it was through the surgeons who were teaching in the hospitals and in private classes that surgery was being established on a sure scientific basis. The opposition of the company was another manifestation of the unthinking defence of exclusive rights.

Some interesting extracts from the proceedings of the court of the company were afforded, illustrating the troubles of the period:

"Here was a complainte against Willm. More by one Henry Dobbyns for that he did not cure his sonne but made him worse. William More was ordered, on account of his ignorance, to meddle no more in surgery."

"Hewe Placket was rebuked for takeing upon him to heale a pacient who ys deade and commaundement given that he shall medle no more in surgerie."

"Whereas there hath been an abuse offered to Mr. ffenton Bynns by Doctr Goodall for giveing internall medicines in a case of Surgery. Ordered that if the College of Phisitians doe arrest Mr. Bynns that he shall bee defended at the cost of the Company for the fact now menconed in Court."

And these from the record of examinations:

"Peregrine Compton. Rejected being fuddled & not answering a question."

"Wm. Ogilby. Rejected & said very saucily it should be the last time."

"William Miles recommended by Lord Torrington and examined but seeming to know nothing of Surgery was rejected."

The Partnership Dissolved

In 1745 the partnership between the surgeons and the barbers, never a happy one, was dissolved, and the surgeons were incorporated as a separate company by Act of Parliament of George II. The only property claimed by the surgeons was the money given by Edward Arris and by John Gale for the endowment of the lectures still annually delivered at the Royal College of Surgeons.

The orator glanced briefly at the progress of medicine and surgery during the two hundred years of the union. Notable figures in anatomy and medicine were Vesalius, Harvey, and Thomas Willis. Of surgeons one of the most eminent was Thomas Gale, who was with Henry VIII at Montreuil. Another was William Clowes, sergeant-surgeon to James I; another of the same reign was John Woodall, leader of the surgeons in their fight against the physicians; but the greatest English surgeon of the seventeenth century was Richard Wiseman, a scientific man and a scholar, who might be said to have raised the status of surgery to a profession. The most famous surgeon at the time of the separation was William Cheselden, a great anatomist and a brilliant operator, who formed a real link with modern surgery. With John Ranby, sergeant-surgeon to George II, he was the main promoter of the separatist movement. Ranby, although he had held no office in the united company, was made the first Master of the surgeons, largely, it was said, out of gratitude for his good offices with the king, with whom he had great influence. Ranby was introduced by Fielding into the *History of Tom Jones* as "Mr. R——, sergeant-surgeon to the king, and having the first character in his profession," and Cheselden was mentioned in Pope's *Imitations of Horace*:

"I'll do what Mead and Cheselden advise,
To keep these limbs, and to preserve these eyes."

The Royal College of Surgeons of England

The Surgeons Company built a hall in the Old Bailey, and the members of the court showed their determination to put teaching in the forefront of their activities, passing a resolution that a theatre be the first part of the new building. The theatre was for the teaching of anatomy and for lectures on surgery, and the first Masters of Anatomy were men famous in the history of British surgery—Percivall Pott and William Hunter.

Unfortunately the governors of the company did not adhere strictly to the regulations laid down by Parliament, and they found that owing to irregularities of procedure their powers had lapsed. After an effort to obtain a new Act of incorporation had failed in the House of Lords (mainly owing to the opposition of Lord Thurlow) it was decided eventually to proceed by petition to the Crown, and in 1800 the Royal College of Surgeons was established by Royal Charter. The College came into existence three hundred years later than the Royal College of Physicians, but the long delay was caused in the first place by the division of the surgeons into two fraternities and authority passing into the wrong hands; in the second place by errors of procedure; and in the third by the attitude of the physicians in treating the surgeons as mere craftsmen. He mentioned Francis Bacon's description of the physicians as "seeing things from afar off, as if from a high tower."

Parliament made large contributions towards the new buildings of the College which had been erected in Lincoln's Inn Fields, and the College acquired the magnificent collection of John Hunter, an imperishable memorial of his industry, and always to be its proudest possession. It had the most wonderful museum of its kind in the world, and the library had grown steadily and now provided "a fully equipped chart room for those who embark on surgery." Research had been carried on continuously ever since the opening of the new building, but a great stimulus had been given to this function of the College in recent times by the provision of the research farm at Downe in Kent, through the generosity of Sir Buckston Browne, and, two years ago, by the provision of new laboratory facilities at Lincoln's Inn Fields by the Bernhard Baron Trustees.

Great Names in Modern British Surgery

Of the men associated with the company and with the Royal College in its early days he mentioned Percivall Pott, the first representative of the scientific and pathological surgeon; Abernethy, Astley Cooper, and Charles Bell, founders respectively of the medical schools at St. Bartholomew's, Guy's, and Middlesex; Benjamin Brodie, responsible for the institution of the Fellowship of the Royal College; and Liston, Hilton, Paget, and others.

If John Hunter laid the foundations of modern scientific surgery, Lister, with Pasteur, shared the chief honour of the great victory over disease. The orator mentioned that a signed portrait of Pasteur and a copy of Truffot's statue of the shepherd boy Jupille which stands in front of the Pasteur Institute in Paris were accounted by Sir John Bland-Sutton as amongst his most inspiring possessions. On Sir John's death he was entrusted with them, and the portrait of Pasteur and the statue of Jupille would one day adorn the Royal College.

Sir Alfred Webb-Johnson ended with a few words on the application of this eventful history to the body under whose auspices he was speaking.

"I think you will appreciate more and more as time goes on the value of having a headquarters of surgery in Australasia. To carry out your ideas you need authority, and that a Royal Charter will give you. To retain your authority you must adhere most carefully to your charter and by-laws. Charters may have to be amended to meet new requirements and new conditions, as they have been several times in the history of the Royal College of Surgeons of England. This may be irksome, but with growing experience it proves to be a restraint

which prevents hasty decisions and avoids changes which time may prove to be undesirable.

"You must work in collaboration with your sister College of Physicians; and must always remember that throughout the ages a golden truth is blazoned—the path of progress is by experiment, research, and trial.

"You are unfettered by tradition, but share a glorious inheritance. Whatever your difficulties, it is clear to one who visits you for the first time . . . that you are making for yourselves—indeed that you have made—a reputation in the world which is equal to that of the great institutions whose annals are linked with our national history and whose glories are the pride of every Britisher."

The progress which the Australasian College had made in the short space of twelve years would have gladdened the heart of George Adlington Syme, in whose name they were assembled.

Messages of Goodwill

Sir Alfred Webb-Johnson had the honour of reading to the President and Fellows of the College a message from Queen Mary conveying Her Majesty's greetings and best wishes for the continued success of their important work: also a cordial message of goodwill and admiration signed on behalf of the Council of the Royal College of Surgeons of England by the President, Mr. Hugh Lett.

Nova et Vetera

THE INSTITUTES OF MEDICINE AND BOERHAAVE

The old title of the institutes of medicine for a chair at Edinburgh (1726) and other Scottish universities set an example followed at Philadelphia (1789) and elsewhere. Thus at McGill University, Montreal, in 1874 (the year the title of the Edinburgh professorship was changed to that of physiology) William Osler, then 25 years old, was appointed lecturer on the institutes of medicine. An extremely interesting paper on the "Influence of Boerhaave's *Institutiones Medicae* on Modern Physiology" has recently been written by Dr. John F. Fulton,[1] professor of physiology at Yale. The title of the Edinburgh chair was the outcome of the enthusiasm of Boerhaave's Scottish disciples for his book, published in 1708, on physiology, a name also used in its text. The first occupant of the chair was Andrew St. Clair, who contented himself with reciting in Latin Boerhaave's *Institutiones Medicae*, and, if a dutiful, was hardly an inspiring teacher. But in 1747 he was succeeded by "one of the most vigorous and original physiologists of all time"—Robert Whytt (1714–66), who later included in his courses the *Institutiones Pathologiae medicinales* (1758) of H. D. Gaub (1705–89), described by Allbutt as "a sensible eclectic physician whose name will enjoy no long immortality." Gaub was a pupil of Boerhaave and professor of chemistry for forty-six years. Whytt also gave his pupils the contents of his own treatise on *The Vital and Other Involuntary Motions of Animals* (1751), which established the concept of reflex action, did much to advance the cause of experimental physiology, and showed that the author was a worthy occupant of a chair created as a result of Boerhaave's influence. The great Albrecht von Haller (1708–74) was also one of Boerhaave's pupils, and in his *Primae Lineae Physiologiae* (1751) and *Elementia Physiologiae Corporis humani* (1757–66), in eight volumes, much expanded his teacher's volume of 250 pages. William Cullen (1712–90), who followed Whytt in 1766 as professor of the institutes of medicine, wrote much on physiology. Fulton also supplies bibliographical data and illustrations about Boerhaave's *Institutiones Medicae*, including the title page of *Institutions in Physick Collected from the Writings of the most eminent Physicians* (1714). This was actually a translation, but without any mention of Boerhaave.

[1] Fulton, J. F. (1938). *Nederl. Tijdschr. Geneesk.*, **82**, 4860.

L.C.C. CONSULTANT AND SPECIALIST SERVICE

The proposals of the London County Council for the provision of consultant and specialist services for the year beginning April 1 follow generally the existing approved arrangements. The arrangement whereby consultant anaesthetists are allocated to general hospitals for a fixed number of sessions a week, instead of being called in as required, has worked satisfactorily, and will be continued, except at St. James Hospital, Balham, where it is proposed that a panel of anaesthetists be set up for service up to a limit of 208 sessions a year, the remuneration to be two guineas for a visit of less than three hours' duration, three guineas for a visit of three hours or more, and four guineas for a visit of four hours or more. The three positions of honorary consultant attached to the New End Hospital, Hampstead, are no longer to be honorary; a sessional fee will attach to their visits.

Treatment of Cardiac Diseases and Fractures

The Council proposes to make a further advance in the appointment of specialist clinical staff in connexion with the cardiovascular unit at Lambeth Hospital and the fracture unit at St. James Hospital, Balham. The Lambeth unit began in July, 1936, and the work is now developing to such an extent that before long it will be necessary to provide a similar unit on the north side of the Thames. It is proposed to appoint a whole-time clinical officer, to be designated cardiologist, who will devote half his time to the Lambeth unit and the remainder to consultation with the medical staff at any other of the Council's hospitals. The unit consists at present of two honorary consultants, one consultant for three sessions a week as required, and the deputy medical superintendent of the hospital. It is proposed to continue the services of the consultants, but the services of the deputy medical superintendent will in future be devoted to the ordinary work falling to that position.

A full-time clinical specialist is also proposed to be appointed to the Council's hospital service for fracture cases. At St. James Hospital alone 735 patients received in-patient treatment for fractures in 1937, and there is a large and growing out-patient section which provides massage and electrical treatment, and so forth. The officer appointed will devote the greater part of his time to the development of the fracture unit at St. James, and the remainder to the supervision and direction of one or more of the other fracture units. The unit at St. James consists at present of a senior assistant medical officer and a visiting orthopaedist. On the appointment of the full-time specialist the services of the orthopaedist can be dispensed with and the group scheme reduced by three sessions a week. The senior assistant medical officer will be released for his ordinary duties.

The scale of salary to be attached to each of the two new positions will be the same as that provided for the grade of surgeon specialist—namely, £1,250, rising by increments of £50 to £1,500 a year, with no emoluments.

Extension of Southern Group Laboratory

The London County Council has in view an extension of the Southern Group Laboratory at Park Hospital, Hither Green. In July, 1934, the preparation and supply of solutions for intravenous injection were begun at the laboratory, and during 1938 as many as 18,749 litres of solutions were issued. There is every reason to believe that the variety and quantity of solutions required will continue to increase. The accommodation has been outgrown, and it is proposed to take a two-story house within the curtilage of the hospital which will contain a manufacturing section with large central sterilizing and still rooms, rooms for the preparation, filling, and labelling of solutions for intravenous injection and ampoules, for the manufacture of media for bacteriological culture, for the preparation of vaccines, and for the storage, packing, and dispatch of laboratory products and apparatus. The cost of the project, including furniture and equipment, will be nearly £40,000.

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AN EXPERIMENT IN REGIONALISM

When the schemes of county and county borough councils for the treatment of tuberculosis were inaugurated in 1912 a voluntary body, known as the King Edward VII Welsh National Memorial Association for the Prevention, Eradication, and Treatment of Tuberculosis, had just obtained its Charter of Incorporation in Wales. While anti-tuberculosis measures in England and Scotland became an integral part of the public health work of counties and county boroughs, all the seventeen major authorities in Wales and Monmouth agreed to exercise their functions through the Memorial Association. It is important to appreciate the motives actuating this policy. A national idea makes a powerful appeal to the national sentiment of the people of Wales. They realized the value, too, of the vigorous and well-directed efforts which this body was already making toward the objects in view, and no doubt they appreciated the saving of public expenditure from the use of the services of an organization which had already collected large voluntary funds. The proposal was not without its opponents, especially in central and local official circles, where the divorce of the management of a disease from the control of environmental circumstances conducive to its incidence was seen to be a disadvantage; and the means by which these voices appear to have been deprived of a hearing did not help to foster happy relations at the outset between the Association and some of the departments concerned.

With the abrogation in 1921 of the responsibility of insurance committees for the institutional care of tuberculous insured persons, local authorities were recognized to have a larger and more direct interest in the work of the Association. Its Charter was accordingly amended in such a way as to give them a dominating proportion of the membership of the board of governors and council of the Association. It became virtually, though not in law, a joint authority in Wales and Monmouth for the diagnosis and treatment of tuberculosis and for public education and those aspects of prevention which are not strictly environmental. Some idea of the growth of its activities may be gathered from the increase in its expenditure from £58,453 in 1913–14 to £337,675 (authorized) for 1938–9. In the earlier year only £33,361 had to be met by public funds, half from rates and half from Treasury grants. Now the contributions from voluntary sources are negligible, and virtually the whole cost has to be met by local authorities, which are not clearly conscious of the extent to which they are relieved by the block grant made for general purposes of local government.

It is easy to understand that this very great increase of contributions, however unreal part of it may be, has roused a critical interest among some authorities who welcomed an apparently economical scheme a quarter of a century ago. They contend, on the one hand, that certain proposed extensions of hospital, laboratory, and other provision are unnecessary, and, on the other, that the statistical basis of contributions is inequitable. In the report of a Committee of Inquiry, summarized in last week's issue of the *British Medical Journal* at page 577, tables are given which demonstrate the very great difference in the percentage distributions among the authorities of rateable value, population, and incidence of tuberculosis. At present the allocation is made on a basis determined as to 50 per cent. by rateable value and 50 per cent. by population. Without making specific recommendations the committee favours weighting of the population factor by the mortality rate from tuberculosis, so as to bring local expenditure more nearly into line with "user."

We have dwelt on these administrative aspects of the problem of tuberculosis in Wales because they are a pointer to all those interested in the problem of regionalization of medical services, an important item in the policy of the British Medical Association. The report gives long and minute descriptions of the housing and sanitary delinquencies of local authorities in Wales, which ought not to be regarded as an indictment of the people of the Principality, but rather as an indication of the inadequacy of our system of local government to meet present-day needs. As the authors say, a similar inquiry in some other parts of this island would probably reveal like conditions. Mortality in Wales from many diseases other than tuberculosis and from all causes among the population at certain ages is equally excessive. The problems in Wales are great, but the administrative and financial resources are small. There are three urban districts with populations well under 1,000 persons and several not much bigger. Of the thirteen counties in Wales and Monmouth seven are under 100,000 in population, of which five have around or just under 50,000 inhabitants and one has 20,000. In these smaller counties the product of 1d. in the £ of rateable value yields sums ranging from £633 to £999—that is, about the

salary of a medical officer. In the numerous urban and rural districts, outside of Glamorgan and Monmouth, autonomy is farcical from the financial point of view. We have, in fact, in Wales a concentration and epitome of the defects of a local government system rapidly becoming obsolete. The Act of 1929 has done little to rectify it.

The great experiment in regionalizing tuberculosis in Wales has been hampered in its execution partly by the inertia of the smaller authorities and perhaps because it accentuated the truncation of public health work. From one point of view Wales and Monmouth form a good unit, since the spirit of the people is a spur to the tackling of national problems; from the purely administrative standpoint it is not perhaps geographically ideal. The Welsh Memorial may or it may not be a good model for other schemes of regionalization. Indeed, curious and difficult questions of adjustment arise when one independent national body is partly answerable to another having jurisdiction over the same area, as the Welsh National Memorial Association in this case stands in relation to the Welsh Board of Health. These would be intensified if an executive body were created for the same area to cover a wide range of medical services. But it is made clear by the recent inquiry that in Wales, and by inference in England, the time has come for the reform of local government areas which the Local Government Act of 1929 has largely failed to achieve.

PSYCHOLOGICAL TREATMENT OF CRIME

Five years ago Dr. W. Norwood East and Dr. W. H. de B. Hubert began an investigation at Wormwood Scrubs prison on the value of psychological treatment in the prevention and cure of crime. Their report has recently been published as a Blue-book.[1] They chose their cases from the group of early recidivists in whom prison or Borstal had proved useless. They found they were dealing with several quite distinct disorders of behaviour, and they classified the 406 cases they examined and the 214 they approved for treatment into the Borstal, adolescent, and adult groups, homosexuals, exhibitionists, other sexual offenders, and offenders against women and girls. They conclude that psychotherapy as an adjunct to an ordinary prison sentence appears to be effective in preventing or reducing the chance of future antisocial behaviour if the cases are carefully selected. As their prisoners have not yet had time to show the results, if any, of the treatment, Drs. East and Hubert cannot produce statistics, but their opinions are based upon careful consideration of all their data. They find that the Borstal and adolescent groups contain a relatively greater number of suitable cases than the groups of sexual offenders, and think that treatment should be extended among these younger people. The presence of an abnormal mental state does not necessarily imply suitability for, nor does its absence contraindicate, psychotherapy. They utter a warning against confining psychiatric treatment of crime to psychotherapy, and think that the future development of psychotherapy may be closely connected with that continuous, detailed, and expert observation and study of behaviour, and that control and modification at will of the total environment of the patient during treatment, which only psychiatric supervision can supply. Psychiatry, moreover, is applicable to a much larger number of cases than psychotherapy alone. They think the efficiency of the prison system and a satisfactory advance in criminology could be aided by a special institution set up for the care, study, and treatment of a selected group of criminals. Cases requiring psychiatric treatment would form the most important group and would include those suitable for psychotherapy alone, for psychotherapy combined with more general measures of psychiatric treatment and training, or for the more general measures alone. The second group would consist of criminals who required investigation because they presented unusual features, and the third of those who needed an environment more suited to their individual requirements. Cases would have to be carefully picked, the adults separated from the younger prisoners and persistent offenders from more recent ones.

Drs. East and Hubert preface their recommendation with the useful reminder that sentence is the business of the judicial authority and that the province of medicine is limited to furnishing evidence to help the court to determine how to combine the best interests of the prisoner with the general welfare of society. They consider that a decision whether an offender on bail or on probation is suitable for psychotherapy should only be taken by approved medical experts. It would in their view be a great misfortune if the psychiatric approach to crime became discredited by irresponsible exponents who were not aware of the complexity of its problems. Psychotherapy on probation, moreover, is not enough by itself, for some offenders require special methods of treatment. It should be confined largely to first offenders whose offence is comparatively slight and who belong to a type for which it has proved to be more effective than probation alone. It should not be used as

[1] Home Office. Report on the Psychological Treatment of Crime. 1939. London: H.M. Stationery Office. (2s. 6d.)

a make-weight in favour of probation rather than imprisonment. Probation on condition that the offender must reside in an institution for treatment would be particularly valuable for persons with incipient mental disease who need institutional care. The help which can be given by existing clinics is limited, and further provision is needed for offenders remanded on bail for investigation of their mental condition, and offenders placed on probation on condition that they receive mental treatment. The authors suggest that in districts where suitable psychiatric clinics are not accessible and the Home Office has a prison its medical officer shall be available to examine persons remanded on bail for investigation into their mental condition. If the remand centres for young persons proposed by the Criminal Justice Bill are set up, the medical officers attached to them should be at the court's disposal for the same purpose. A material advance would be made if local authorities generally established psychiatric clinics and these were made available for persons on bail or probation. The authors urge that prisoners who are to receive psychological treatment in prison should be given sentences longer than six months, and suggest that courts of summary jurisdiction should have power to impose longer sentences.

In the opinion of these investigators the most satisfactory plan would be to create a special kind of penal institution. It would be first a clinic and hospital; secondly, a place where selected patients could live under special conditions of training and treatment; thirdly, it would be a colony for offenders who cannot adapt to ordinary social conditions but for whom specialized reformative methods are useless and the severity and hardship of the prison inappropriate. Its fourth function would be that of an observation and treatment centre for Borstal lads who, because of mental abnormality, were unsuited to ordinary Borstal training. The medical staff should be psychiatrically trained and have experience of criminology; the superintendent should be a keen psychiatrist. The inmates should be subject to necessary discipline, and if they refused to co-operate should be sent back to prison. The authors doubt whether a sentence of detention in a special institution for psychological treatment is practicable. It might detain the prisoner longer than is appropriate, and he might have to be transferred to an ordinary prison, in spite of the special sentence, if he misconducted himself. Finally, though their investigation has dealt only with male prisoners, they feel that their experience justifies them in recommending the appointment of a woman psychotherapist to a women's prison. Any extension of the psychiatric and psychotherapeutic service to prisons and Borstal institutions should be centralized as much as possible, so that research material may be collected together.

This is certainly one of the most important pieces of work that has been undertaken in penology for many years. There seems every reason to agree with the authors that if their recommendations are carried out psychiatric medicine will greatly extend its usefulness in the prevention and treatment of crime.

"SULFAPYRIDINE"

One of the earliest reactions to the advent of M & B 693 in the United States has been the labelling of it with an American and non-proprietary name. "Sulfapyridine" is the subject of a preliminary report[1] by the Council on Pharmacy and Chemistry of the American Medical Association, whose conclusions may cause some surprise. They are, briefly, that there is sufficient evidence of its value in pneumonia to warrant further trials under controlled conditions, but not to justify general use or the abandonment of serum treatment; that such trials should also embrace staphylococcal and Friedländer's bacillus infections; and that there is no evidence of the superiority of the drug over sulphanilamide for treating infections by haemolytic streptococci, meningococci, gonococci, or *Cl. welchii*. This statement may appear unduly cautious, and in connexion with pneumonia it is certainly an understatement of the facts of experience in this country, even though reports based on them may not be above criticism. At the same time there lie behind it certain grounds of complaint of which we shall do well to take heed. The contention of authorities in America, which has found even more forcible expression elsewhere than in this report, is that the clinical employment of this drug has far outrun the experimental study on which it should be based; that preliminary laboratory tests have furnished the excuse for indiscriminate and uncritical clinical use on an almost unprecedented scale. An answer to this accusation is, of course, that when such a drug as this is discovered, and its effects become known from preliminary reports in the medical press, it is neither easy to withhold it from general distribution nor even perhaps justifiable if, as in this case, it seems to have an actually life-saving effect. We venture to predict that further experience in the U.S.A. will lead to a full recognition of its value in pneumonia, though what place it will ultimately take in the treatment of that disease, and in particular how its advent will affect the future of serum treatment, are still open questions. On the other hand, a critical survey of published data such as is furnished in the American report does undoubtedly provide little reason for concluding that the drug is superior to sulphanilamide in attacking any micro-organism other than the pneumococcus, and the wide wave of enthusiasm for it deserves to be checked until some of its other uses are justified by the results of

[1] *J. Amer. med. Ass.*, 1939, **112**, 538.

careful observations on a large enough scale. Whatever the inadequacy of controlled therapeutic studies, the criticism that investigation on pharmacological lines has been neglected cannot be denied. American workers have not been slow to discover that the absorption of the drug from the alimentary tract is variable and incomplete. To judge by the experimental findings of E. K. Marshall,[2] the variation in the degree of absorption may be at least threefold, and when very large doses are given only a small fraction may enter the circulation. Clinical confirmation of this is to be found in a report by H. F. Flippin *et al.*,[3] who treated 100 cases of pneumonia with good results and studied the concentrations of the drug attained in the blood; not only did this vary from as little as 1 to as much as 18 mg. per 100 c.cm., but there was singularly little difference in therapeutic effect between groups of patients showing respectively low and high concentrations. Here is evidently something calling for further elucidation. Marshall's experiments include determinations of toxicity using the sodium salt of the drug, which is highly soluble and fully absorbed; they indicate a greater degree of toxicity than that of sulphanilamide and must be held to supersede English results, which are undoubtedly vitiated by failure to take into account the factor of incomplete absorption. That elementary information of this kind should have been lacking during many months of therapeutic trial and application, which latterly has assumed huge proportions, is certainly not as it should be. A good deal has evidently still to be done in enabling "sulfapyridine" to be used with proper understanding of its behaviour in the body, and hence, presumably, to the best effect of which it is capable.

TONSILLECTOMY AND JUVENILE RHEUMATISM

W. B. Allan and J. W. Baylor offer as an excuse for yet another contribution on tonsillectomy and juvenile rheumatism the fact that their group of 108 patients has been followed up for a longer period than in most of the studies on this aspect of an unsolved problem. This makes their recent paper[4] of great value, and the fact that ninety of the group have been followed for from ten to twenty-three years and the remaining eighteen for periods up to ten years brings out certain points of importance. It has been stressed by other authorities that recrudescences of rheumatic fever are more likely to occur within the first five years after the initial manifestations than at any later time. But the present figures suggest that those patients who live more than five years after tonsillectomy will experience as many recrudescences after their five-year period as during it. The percentage of patients with recrudescences of acute rheumatic manifestations after tonsillectomy in the present series was 43.5, but it is significant that rheumatic heart disease developed in only six of the forty-nine rheumatic patients who had no cardiac involvement at the time of operation. This is in accordance with the current teaching in London that, whereas tonsillectomy in a rheumatic child is no protection against further outbreaks of the rheumatic disease (arthritis or chorea or both), such fresh outbreaks are less likely to be associated with cardiac involvement than if the tonsils had been left alone. But another important fact emerges from the paper. The authors state that of the eighty-six patients who returned for examination twenty-nine were found to have foci of infection in the nasopharynx, and seventeen of the twenty-five patients who had had recrudescences of rheumatic fever were in this group with persistent nasopharyngeal infection. Unfortunately no details are given of what form such persistent infection took, and it would be helpful to have the answers to such questions as the presence or not of tonsillar remnants, the efficiency of the original tonsillectomy (tonsillotomy or dissection, for example), and whether or not nasal sinus infection is included in the general term "nasopharyngeal sepsis." Clearly if the operation of tonsillectomy and adenoidectomy in children with rheumatic manifestations is to fulfil the purpose which is justified by the present and other investigations—namely, prevention of cardiac involvement—it must effectively remove the diseased tissue which is the portal of entry of the rheumatic virus. This most recent study confirms the value of the operation efficiently performed, but unfortunately the core of the problem remains because the degree of efficiency is not assessed.

PREGNANCY TESTS

The clinical diagnosis of early pregnancy is notoriously difficult and inaccurate, and in view of the late appearance and equivocal nature of many of the physical signs the problem must usually be resolved by recourse to one or other of the chemical or biological tests now in vogue. Such a relegation is inevitable, for increasing experimentation must progressively increase the accuracy and diminish the latent period of the established methods, and perhaps introduce new procedures of more certain value. In view of the volume of laboratory work produced within recent years on this subject there has not unnaturally been some confusion about its clinical application, and the value of the various tests suggested and employed may now well be assessed. This has been done by Blitsein[1] in an exhaustive comparison of the Aschheim-Zondek, Friedman, phloridzin, cholesterin, and pupillary tests. His conclusion that only the first two are sufficiently accurate to be of practical value is the one generally held by most gynaecologists, but these cumbersome and lengthy laboratory procedures will probably, in the long run, be supplanted either by a modification of one of the short tests mentioned or by the evolution of some more accurate new one. The number of pregnancy tests is legion, and no one person, as deLee[2] says, could live long enough to try them all out. Several, however, have a certain scientific basis and the possibility of future clinical application, and of these Patterson's

[2] *Science*, 1938, **88**, 597.
[3] *J. Amer. med. Ass.*, 1939, **112**, 529.
[4] *Johns. Hopk. Hosp. Bull.*, 1938, **63**, 111.

[1] *Rev. franç. Gynéc.*, October, 1938, 779.
[2] *Year Book of Obstet. and Gynec.*, 1937, **25**, Chicago.

oestriol test is perhaps the most promising. It depends on the fact that the urinary oestriol–oestrin ratio is radically changed during pregnancy to the extent of 10:1, the determination being made by utilizing the Kober colour reaction. The test is extremely rapid (twenty-four hours), and is almost as accurate as the Friedman. A simpler method devised by Samuels utilizes the changes in the reduction time of oxyhaemoglobin, as measured by his special cycloscope. It is extremely rapid and requires no special experience, but most clinicians who have tried it out are sceptical of Samuels's claims of its infallibility. The Visscher-Bowman chemical test for urinary prolan has similarly failed to fulfil its early promise, for the percentage of false positives is too high for reasonable accuracy. The same fault is inherent in the intradermal antuitrin test, Abramson's serum relaxin test, and other semi-chemical procedures, while Smith's ingenious biopsy method is inapplicable in a proportion of cases. It appears, therefore, that a reasonable accuracy can be expected only from the Aschheim-Zondek or the Friedman test, a somewhat disappointing reflection on the enormous amount of work involved in recent researches. It does, however, emphasize the superiority of the biological method and lends particular interest to the results in toads recently recorded by Elkan.[3] The animal used is the female South African clawed toad, *Xenopus laevis*, and the method consists in injecting a small quantity of the patient's urine and watching for ovulation, which is produced if a sufficient quantity of anterior-pituitary-like hormone is present. The result is apparent in twelve hours or less and seems to be reasonably accurate, though further research and breeding difficulties may diminish the initial promise. However that may be, it is in this direction that further progress may be anticipated, and it is not too much to expect the production in a comparatively short time of a biological test which will satisfy the most exacting requirements of rapidity, certainty, and facility.

[3] *British Medical Journal*, 1938, **2**, 1253.

INTERNATIONAL A.R.P.

When the International Conference of Military Medicine was sitting in Luxembourg last July it devoted a whole day to a discussion on aerial bombardment, promoted by the Permanent Committee of Military Medicine and Pharmacy and the International Law Association. At that meeting a new body was inaugurated under the name of the Committee of Information and Action for the Protection of the Civil Population in Time of War. This committee decided at its first meeting to issue a quarterly review which should deal with every aspect of the subject and contain the information available from all countries. The scope of the journal includes all the transactions of the committee; the examination of all Government orders relating to protection; notes on parliamentary debates and legislative or executive action; an account of the work of organizations devoted to the protection of the civil population; abstracts from literature; and a record of all facts relating to defence or the impingement of war upon civil populations. The first number[1] gives an account of the inauguration of the committee and the journal, with a full report of its sessions. Among the original articles and lectures is a historical survey by Dom F. Weisgarber of the lot of non-combatants during armed conflict. He shows that the lot of the civilian has been uniformly intolerable throughout all ages, for amid the passions of war no considerations of mercy or justice, and hardly even of partisanship, protect the unarmed. The task of men of international good will is, as he conceives it, to translate inherited tradition into terms of modern values, inspired always by the religious ideal. M. Jansma of Holland, writing on the protection of the civil population in modern warfare, outlines the projects that have been put forward at The Hague and later at Monaco for banning aerial attack against non-military areas and establishing safety zones. These measures have already been applied to a certain extent in Spain and China. He admits that in the present state of things military protection is likely to be of more value than legal protection. Dr. Abdel Moneim Riad Bey of Egypt proposes naïvely to abolish aerial bombardment altogether, but does not give any indication of how he hopes to persuade the totalitarian Governments to fall into line. Professor Quero Molares recounts the various formal expressions of horror at aerial bombardment put forward at meetings of the Council of the League of Nations, and summarizes the means of defence. He offers no solution for the problem of dealing with Governments which have no respect for international law or for their treaty obligations. Major-General Allen W. Gullion, Judge Advocate General, U.S. Army, contributes a long paper on the present state of international law in this field. The subject of women in war is dealt with by Mme. J. Foncken, the wife of the secretary-general of the committee. She adds some data concerning the part which various Governments lay down for their women in war-time. Dr. Alexander Myer, in a study of the possibility of legal protection for civil population, calls for clear definition of the concepts "peaceful" and "non-peaceful" in relation to a population, and of terms such as "military objectives." He would retain the principle of international law that direct attack upon a peaceful population is forbidden and that aerial attack is forbidden even in the form of retaliation. The creation of safety zones, while possible from a legal point of view, "needs further study" from the practical aspect. In the first place they cannot accommodate more than a limited part of the civil population, and, secondly, they will only be completely effective if every attack on them is forbidden. There is a fairly complete collection of documents relating to aerial attack on civilians, notably a number of statements by heads of Governments. One is left, however, with the feeling that international law is so unimportant nowadays as a factor modifying the behaviour of nations in war-time that it is hardly worth the time and study that are spent on it.

[1] *La Protection de la Population Civile en Temps de Guerre.* Organe trimestriel du Comité de Luxembourg. No. 1. Paris: Les Editions Internationales. 25 frs.

MANGANESE DEFICIENCY

Manganese is a constituent in the well-known compound syrup of hypophosphites, though curiously enough in the syrup of glycerophosphates it is replaced by magnesium. The action of substances used as tonics is often debatable and obscure, but there is a possibility that manganese may be a significant element in nutrition. In young chickens manganese deficiency leads to slipped tendon or "perosis," a deformity of the tibio-metatarsal joint.[1] It appears that manganese in small amounts is a necessary constituent of bone in the chick, and in its absence the shafts of the bones become shortened and thickened. The eggs of hens which are fed on a diet of low manganese content produce chicks with short legs and wings and "parrot beak," but the injection of a minute dose of manganese directly into the albumen of such eggs just before incubation results in normal development of the embryos and an increase of hatchability.[2] Although gross symptoms of perosis have not been recognized in animals other than the fowl, manganese is present in the bones of other species, particularly in the shafts and head. Of all the vertebrates the mammals contain least manganese; there is from five to ten times as much present in birds, reptiles, batrachians, and fish.[3] It is interesting to speculate whether deficiency of manganese plays any part in skeletal dystrophies in man, and material for such speculation can be found in Ethel Browning's[4] interesting review of the role of manganese in plant and animal economy. Manganese is an essential factor in plant metabolism and growth, being concentrated in those parts of the plant where reproductive activity is highest. It appears to be essential for the action of the oxidase ferment "laccase," which takes part in a host of natural phenomena, such as the transformation of the latex of the lac tree to black varnish, and the darkening of many fruits on contact with air. It is a normal constituent of practically all animal tissues, though in a much smaller degree than in plants, but it is not known whether it is an indispensable constituent of the animal organism. The absorption of manganese is said to be slow and dependent on the acidity of the gastric juice. Excretion takes place mainly by the stools. In children the amount retained is proportional to the amount injected. It is suggested that the diet for children should contain between 0.2 and 0.3 mg. of manganese per kilogramme of body weight. A diet fairly high in manganese would contain meat, eggs, milk, bananas, potatoes, tomatoes, orange juice, cod-liver oil, wholegrain cereals, and fruits and vegetables such as carrots, apples, and prunes. A diet composed chiefly of milk and refined cereals would be lower in manganese than was consistent with full growth and development. Manganese is almost certainly not required for blood formation, but there is evidence which suggests that it may be necessary for growth and reproduction. It is difficult, if not impossible, to give experimental animals a diet which will be deficient in manganese alone, but, nevertheless, some of the effects of such deficiency are known, notably in connexion with reproduction. David Perla[5] has shown that feeding rats with excess vitamin B_1 results after one generation in interference with lactation, loss of the maternal instinct, cannibalism, and progressive loss of fertility. Deficiency of manganese in the diet causes similar changes in the maternal instinct and reproduction, and Perla[6] therefore argues that manganese may be essential as an oxidative catalyst in the utilization of vitamin B_1 in the tissues. To test the hypothesis that the tissue manganese may be exhausted by an excess of vitamin B_1 he added small amounts of manganese to the test diets, and showed that those rats receiving the manganese supplement did not undergo the changes described above. According to him, therefore, manganese is essential in the utilization of vitamin B_1 by the tissues.

[1] *Science*, 1938, **87**, 18.
[2] Ibid., 1937, **86**, 328.
[3] *Ergebn. Vitamin Hormonforsch.*, 1939, **2**, 192.
[4] *Sci. Progr.*, 1937, **32**, 276.
[5] *Proc. Soc. exp. Biol.*, N.Y., 1937, **37**, 169.
[6] *Science*, 1939, **89**, 132.

ROYAL SOCIETY ELECTIONS

The twenty new Fellows of the Royal Society elected on March 16 include C. H. Andrewes, M.D., F.R.C.P., pathologist, National Institute for Medical Research; F. A. E. Crew, D.Sc., M.D., professor of animal genetics in the University of Edinburgh; H. M. Turnbull, D.M., F.R.C.P., professor of morbid anatomy in the University of London and director of the Bernhard Baron Institute of Pathology at the London Hospital; and V. B. Wigglesworth, M.D., lecturer and research fellow in medical entomology at the London School of Hygiene and Tropical Medicine; also F. W. Edwards, Sc.D., deputy keeper of entomology, British Museum; G. W. C. Kaye, D.Sc., of the National Physical Laboratory; G. S. Adair, M.A., assistant director of research in physiology at Cambridge; and E. J. Maskell, Ph.D., lecturer in plant physiology at Cambridge.

We regret to announce the deaths of Mr. J. L. Joyce, the well-known Reading surgeon, who was vice-president of the Section of Surgery at the Annual Meeting of the British Medical Association at Oxford in 1936; and of Sir Henry Lunn, who graduated M.D. of Dublin University in 1887, before he entered political life and founded the travel agency which bears his name.

The committee of the British Standards Institution which prepared the British standard specification for haemacytometer counting chambers and haemacytometer dilution pipettes, No. 748-1937, has now prepared a draft specification for haemoglobinometers. This has two notable features. First, it provides a definite colorimetric basis for the standard colour tubes, and, secondly, it ensures that any graduated haemoglobinometer tube complying with the specification may be used with any colour tube complying with the specification. The institution is now circulating copies of this draft specification for comment, and is desirous that the draft should receive the widest possible consideration so that the specification when finally published may command the maximum possible measure of agreement. A copy of the draft specification may be obtained, post free, on application to the Director, British Standards Institution, 28, Victoria Street, London, S.W.1, to whom also suggestions for amendments to the draft should be sent. All comments submitted to the institution will receive careful consideration when the draft is being revised for publication.

SURGICAL PROCEDURES IN GENERAL PRACTICE

This is one of a series of articles contributed by invitation

PRURITUS ANI

BY

A. LAWRENCE ABEL, M.S., F.R.C.S.

By the term "pruritus ani" is literally meant "an itching at the anus." *Gould's Medical Dictionary* defines pruritus as "itching, a peculiar uncomfortable sensation due to irritation of a peripheral sensory nerve and leading to scratching." As itching cannot occur without some causative factor pruritus must be regarded as a symptom rather than as a disease in itself. Nevertheless it is true that definite changes in the anal and peri-anal skin occur in the vast majority of those who complain of irritation, and it is reasonable to apply the term "pruritus ani" only to cases in which these skin changes are present. If the underlying cause or causes—for they are often multiple—are correctly diagnosed and adequately dealt with suitable local treatment to the affected skin is likely to meet with complete success. Conversely, if the factors which have produced the irritation are inadequately dealt with no amount of local treatment is likely to effect a permanent and complete cure.

For practical purposes the simplest classification of the causes of pruritus ani would appear to be as follows: (1) excessive moisture; (2) functional (that is, hysterical or psychological); (3) infective.

Excessive Moisture at the Anus

This condition may arise from within the bowel or from the skin itself. In the former case seepage of mucus from the mucosa of the rectum and anal canal is the commonest cause, but pus, blood, or liquid paraffin may also seep past the sphincters. In the latter case the condition is due to lack of cleanliness, excessive sweating, local irritation by clothing, or a specific disease of the skin.

CAUSES WITHIN THE BOWEL

Any abnormality of the rectum or anal canal tends to give rise to a hyperactivity of the mucous membrane and an excessive secretion of mucus, larger or smaller quantities of which, leaking past the sphincters, cause sogginess of the anal and peri-anal skin. Even minute quantities may produce the typical changes of pruritus ani. The skin typically becomes reddened, the rugae enlarge from oedema, and superficial erosions often occur. As the condition becomes more chronic thickening and induration arise from cutaneous and subcutaneous fibrosis. These changes in turn are followed by fissuring and cracking of the epithelium, accompanied by pain, and infection by intestinal and other organisms, which still further increase the local dermatitis. The commonest diagnosable and treatable conditions in the rectum are as follows:

Rectal Constipation.—Careful examination will often reveal an imperfectly emptied rectum, even after what appears to the patient to be a satisfactory daily evacuation of the bowel. Similarly, in patients who have two or more evacuations of the bowel, careful examination will often reveal that the rectum has only been partly emptied at the first action and is not completely emptied at the second or even the third. The presence of a faecal mass resting like a bung on the pile-bearing area of the rectum will in a large proportion of cases give rise to enough local congestion and hyperaemia to produce a slight excess of mucus, which may seep through the anal sphincters and reach and irritate the external skin. Another effect of this type of constipation is to cause flatus to be voided frequently, and this will further allow the passage of mucus and tends to slight soiling around the anus.

Pectenosis.—Passive congestion, with varying degrees of sphincteric spasm, may eventually give rise to a deposition of fibrous tissue beneath the mucous membrane of the anal canal in its middle portion, which is known to anatomists as the pecten. This band of fibrous tissue, named by W. Ernest Miles the "pecten band," is another common abnormality in cases of pruritus ani, and the condition is known as pectenosis.

Internal haemorrhoids in early, intermediate, or late stages of development are common accompanying factors. A fissure, prolapse of the rectal mucosa, hypertrophied anal papillae, inflammation of the Morgagnian crypts, and blind internal fistulae may, severally or in multiple, be the underlying causes of the condition. Occasionally the excess of mucus comes from a simple or malignant tumour of the rectum or anal canal. Many of these factors are brought into play or have their effects magnified by too rich a diet and by alcohol. This is especially true in those classes of society which can afford them. Rare cases are found to have an achlorhydria, and Swift believes that in these there is a diminished absorption of vitamin A from the dietary. This lack of vitamin A results in deficient nutrition of epithelium. Similarly, a lack of absorption of vitamin B may give rise to altered sensation of nerve endings. Difficult cases should accordingly bring into mind the possibility of avitaminosis. I have only once known tobacco to be the most important determining factor, and in this case the unfortunate individual was a medical man.

MOISTURE OF THE SKIN

The commonest cause under this heading is lack of cleanliness. The relatively more dirty habit of using paper, which is common throughout the "civilized" races, instead of washing after defaecation is responsible for a large number of the milder grades of pruritus ani, especially in more hairy individuals. A thorough wash night and morning in all adults is obviously the counsel of perfection. Excess of sweating, especially in the more arduous occupations, or in times of stress and worry in some individuals, is often sufficient to produce the typical skin changes.

Thick woollen underclothing may be responsible for or may aggravate pruritus. Those of us who have had the privilege of seeing a large number of our fellow-countrymen let down their nether garments, and who have taken the opportunity to observe the same, are aware that the British housewife loves to do her most thorough darning in the area which is the seat of pruritus ani. These patients often improve considerably if their underwear is made of pure silk or at any rate of artificial silk, or, failing that, of linen mesh. Occasionally the peri-anal affection is associated with a generalized derma-

titis, a gouty diathesis, or with glycosuria. It frequently accompanies pruritus vulvae, and then usually has its origin in the field of gynaecology. Skin tags around the anus increase the likelihood of lack of cleanliness and excess of sweating, and often have to be removed before much headway can be made with local treatment.

Psychological Causes

Although it is true that there is almost always a peculiar nervous temperament, with an inclination to easy worry, in a very large majority of those who suffer from pruritus ani, it would appear that many cases of the more serious types of pruritus are entirely due to an abnormal mental make-up. In these cases associated hysterical manifestations, such as loss of corneal reflex, anaesthesia of the palate, patchy anaesthesia of the face and legs, grossly exaggerated knee-jerks, are often present. Worry is a factor both before and after the development of the condition. For obvious reasons this type of case is the most difficult to treat. The condition may be compared to the clinical entity of dermatitis of the vulva with cervical erosion in highly strung neurotic women.

Infective Causes

The most frequent single infective factor, especially in children, is the common threadworm. One or more of these may sometimes be seen wriggling at the anus, or a proctoscope may reveal their presence in the rectum. The threadworm tends to come into the rectum and anal canal towards evening, having migrated there from higher up. Doubtful cases should therefore always be examined in the latter part of the day. It is my practice at the Gordon Hospital to subject all patients, where indicated, to a high colon wash-out, specifically to exclude the presence of *Enterobius vermicularis*. The next most common parasite is the *Pediculus pubis*. Careful inspection will reveal the presence of the parasite and its ova not only around the anus but also in the pubic region. Scabies may also affect this region and give the typical appearance, and may extend to other parts of the body.

Very rarely the cause of a local infection is a fungus or yeast. In these cases the affected areas of skin have a circumscribed and well-defined border, and microscopical examination of a suspected case will reveal the presence of either *Monilia albicans* or epidermophyton or trichophyton, and clinch the diagnosis.

Symptomatology

The most prominent symptom is itching. This may be anything from a mild irritation lasting for a few seconds after the patient gets warm in bed, or after the bowels have moved, up to an intolerable irritation, which may be more or less continuous, accompanied by burning and smarting and with soreness due to the excoriations produced by scratching. The patient may be able to control the itching by pinching or squeezing the affected part, but often he wakes at night to find himself in the act of scratching, and his sleep may be seriously disturbed, to the point of affecting his health.

A careful case history must be taken of all patients, and examination must be made in a good light; it should consist of external inspection and palpation, and digital and endoscopic exploration of the anal canal and rectum. Careful examination of the abdomen and pelvis should also be made. The urine must always be examined for sugar, and the patient's constitutional state and mental make-up taken carefully into account. Never rely upon general causes for pruritus ani, except when the most minute investigation has failed to reveal any local source of irritation.

The changes seen in a typical case have been detailed above; the skin may be macerated and moist, or shiny and dry, with denuded epithelium; there may be associated scratch marks with linear pigmentation and decapitated follicles. Pyogenic infection may have supervened, with pustules and even boils. In severe cases these are concomitant with the pruritus and are the result of scratching and superadded infection.

The treatment of cases of pruritus ani will be described under the following headings: hygienic; dietetic; medicinal; local treatment—(*a*) directed to the cause (operative and non-operative), (*b*) directed to the skin (by surface applications, by subcutaneous injection, and by operation).

Hygiene and Diet

As already stated, silk or artificial silk underclothing should be substituted for wool or flannel. Careful cleanliness is most important. Daily, or preferably twice-daily, washing is advised for all adults. Hairy individuals occasionally need peri-anal shaving until the skin becomes normal.

Depending on the severity of the condition, alcohol, coffee, tea, and sugar should be limited or even forbidden. Meat should be restricted, and shell-fish, tinned food, pickles, spices, and all highly seasoned foodstuffs should be avoided.

Medicinal Treatment

As already indicated, careful attention must be paid to the state of the bowels. The ideal at which to aim is a regular, smooth, hundred-per-cent. daily action, which should take place shortly after the patient has broken his fast. Thereafter the rectum should be completely empty for the remainder of the twenty-four hours. The drug that appears to have the best effect upon the last few inches of the large intestine is senna. The most satisfactory method of administering this is as follows:

℞ Pulv. fol. sennae ... ...
Pulv. rad. jalapae ... ... āā 3 grains
Pulv. sulph. sublim. ... ...
Theriaciae nigrae ... ... ad 1 drachm

Fiat confectio. Mitte 4 ounces.
Sig.—One drachm nocte.

The patient should be instructed to start by taking a small eggspoonful of this electuary regularly at night-time, varying the quantity with the effect produced. After two or three days the patient will find that he gets a regular, soft, and complete evacuation of the bowel each morning; and its use should be continued until considerable progress with the remainder of the treatment has been made. It will be found that after two or three weeks the nightly dose can be stopped for one night and still the bowels will work the following morning. The next night the patient should take his dose. He may then miss two nights, still with two daily evacuations. In other words, this preparation is not what is commonly known as "habit-forming," but it actually does get the bowel into a good habit, which is continued after the medicament is stopped. In rare cases the complete senna leaf is found to cause griping, and an alternative way of giving senna is as an infusion. Eight or ten leaves are soaked in cold water for not more than three hours, and the resulting "tea" taken about 10 p.m. If cold water is used and not hot, and not more than three hours are allowed for soaking, the griping element of senna is not obtained, and a satisfactory action of the bowels occurs.

The following evening a smaller or larger number of leaves are infused, until the appropriate number to suit that particular individual is found. If liquid paraffin is used it must not be given in doses large enough to cause seepage, as this in itself is a potent cause of irritation, which outweighs its benefit as a lubricant. Any aperient that produces numerous loose watery stools is to be avoided. When the itching disturbs the night's sleep, allonal, luminal, bromide, valerian, phenacetin, and veganin are valuable as sedatives. Achlorhydria or avitaminosis should receive suitable treatment.

Local Measures

A number of the underlying causes of pruritus ani can best be dealt with by a radical operation. Cases of pectenosis should be treated by pectenotomy—that is, division of the pecten band. Internal haemorrhoids in the third degree or stage of their development and the still more advanced intero-external (or van Buren) piles require the modern ligature operation; some cases of chronic fissure and all fistulae, and of course any neoplastic disease, must undergo radical surgery; and skin tags causing irregularities of the surface should be removed.

Injection of Sclerosing Fluid

The early and intermediate stages of internal haemorrhoids may satisfactorily be dealt with by the injection of a sclerosing fluid. The one most commonly in use is 5 per cent. phenol in almond oil. This is injected beneath the mucous membrane high up in the pile. The routine treatment at the Gordon Hospital is to inject a large quantity, up to but not exceeding 10 c.cm., into one pile only at the first sitting. Approximately one week is allowed to elapse before the next injection, and each of the three primary piles is treated in turn. When all three have been dealt with, an interval of three to four weeks is allowed to elapse and the condition reviewed to ascertain if further injections are necessary. The larger variety of piles will require two, or occasionally three, applications. The second type of injection fluid which is sometimes required for the lower portion of the pile is from 5 to 7 minims only of a 20 per cent. solution of phenol in equal parts of glycerin and water. This is given deeply into the centre of the pile mass itself.

The effect of any sclerosing injection may be augmented by the use of an astringent ointment, the most efficacious of which is made up as follows:

℞	Unguentum hydrarg. subchlor. *B.P.* ...		½ ounce
	Sterile white vaselin	ad	2 ounces

Fiat ung. Mitte 2 ounces.

The patient is instructed to place a little of this ointment on his finger and gently to milk it into the rectum before and after each action of the bowels, and again before going to bed, throughout the course of his injection treatment. Immediately the injections and the use of the ointment are started the quantity of mucus produced by the pile-bearing area is diminished and the irritation begins to subside.

In cases of anal fissure, injections may again be employed with considerable benefit. In this case an injection containing an anaesthetic with a prolonged effect is given with strict aseptic precautions into the substance of the external sphincter muscle. B.A.B.A. with percaine, or proctocaine, is most commonly used, and from 5 to 10 c.cm. may be given in a fan-shaped manner on one or several occasions. Its effect is augmented by the use of an astringent anaesthetic and antiseptic ointment, as, for example, the aforementioned ointment containing 10 grains of percaine hydrochloride to each 2 ounces.

In those cases where threadworms are a cause of the condition treatment should consist of a rectal injection of 4 ounces of a salt-and-water solution, using two teaspoonfuls of salt to 4 ounces of water. The injection should be given in the evening with an ordinary bulb or Higginson enema syringe. The cure may be accelerated by the use of either santonin 2 grains with 1 grain of calomel each night for three nights, or one tablet of butolan three times a day for a week. Half these doses should be given to children. Great personal cleanliness is important, especially the washing of the hands after defaecation in order that reinfection may not continually occur.

Scabies quickly responds to the use of sulphur ointment, and should disappear if the underclothing is changed and cleaned night and morning for three days. Pediculosis is cured by shaving and the use of a mercurial ointment. Fungus infections are best treated with frequent swabbings of the affected parts with 1 per cent. solution of methyl or gentian-violet in 25 per cent. spirit, followed by the application of a good dusting powder.

1. Surface Applications to Skin

In cases where an acute dermatitis is present Miles finds the following ointment of value:

℞	Pulv. zinc. ox.		2 drachms
	Lin. camph.		3 drachms
	Anaesthesin		2 drachms
	Lanolin		1 ounce
	Vaselin	ad	3 ounces

Fiat ung. Mitte 3 ounces.

Sig.—To be smeared on the affected part two or three times by day and on going to rest.

For local application by the patient when the dermatitis is less acute, Gabriel has found the following lotion very efficacious:

℞	Phenol		1 drachm
	Zinc oxide		2 drachms
	Pulv. calamin. prep.		1 drachm
	Glycerin		2 drachms
	Spirit. rect....		2 drachms
	Aqua rosae...		½ ounce
	Milk of magnesia...	ad	4 ounces

Sig.—To be dabbed on the anal region morning and evening; if necessary a compress moistened with the lotion may be applied during the night.

I have found the following treatment of great help in many cases, especially where superficial fissures and local soreness exist. The affected skin is painted with a lotion consisting of 20 per cent. phenol in equal parts of glycerin and water. After 15 or 20 seconds the excess of this lotion is removed by gently dabbing with cotton-wool, and the following ointment then applied:

℞	Pulv. zinc. ox.		2 drachms
	Lin. camph.		3 drachms
	Percaine hydrochloride		10 grains
	Sterile white vaselin	ad	2 ounces

Fiat ung. Mitte 2 ounces.

Sig.—To be applied to the affected part two or three times a day and on going to bed.

The 20 per cent. phenol in glycerin and water solution should be applied by the medical attendant only, and may be repeated in from three to seven days, depending on the severity of the case.

Other types of ointment that have been found efficacious have been percainal and nestosyl: the latter may be combined with a nestosyl suppository passed into the anal canal before going to bed. In those cases where oedema of the skin around the anus occurs, Miles finds that a

lotion of lead acetate—prepared by mixing one drachm of liquor plumbi subacetati with two tablespoonfuls of fresh milk—gives great relief. Where an unhealthy surface epithelium exists superficial layers of the dermis may be destroyed by using a saturated solution of silver nitrate applied to the surface with a camel-hair brush and after ten minutes neutralized by a normal solution of sodium chloride. This may be applied twice a week, and will stimulate the superficial excoriations to heal. At a further stage a dusting powder containing zinc and starch, or zinc starch and boric acid, may be used by day and the lotion or ointment by night.

2. Subcutaneous Injection

It occasionally happens in the most severe grades of pruritus ani, and especially in the so-called functional type of case, that local applications to the surface have little or no beneficial effect, and recourse has then often to be had to the subcutaneous injection of oil-soluble anaesthetics or sclerosing solutions. In these severe cases local anaesthesia of the irritating area can be produced, with much benefit to the patient's state of mind, a relief from scratching, and a healing of the local excoriations and dermatitis. The mere prick with a needle appears often to improve the patient's psychology. A number of oil-soluble anaesthetics are available. The most popular are Gabriel's percaine in oil, Gorsch's anucaine, B.A.B.A. of Martindale, and Morgan's proctocaine. B.A.B.A. with the addition of 1 per cent. percaine also gives good results. With strict aseptic precautions a large injection of the solution, varying from 10 to 30 c.cm., is given by means of a long needle, through healthy skin, in a fan-like manner deeply into the peri-anal region. A finger in the anal canal makes sure that the latter is never punctured. Gabriel recommends, and I believe wisely, that the treatment should be carried out in a hospital or nursing home, where careful attention can be paid to the patient's sleep, the regulation of the bowels, and local treatment by surface applications.

Haynes advises the use of from 10 to 20 c.cm. of a sclerosing solution of 1 in 2,000 hydrochloric acid. Through a single posterior puncture a four-inch needle is passed, and a sterile solution of 1 in 1,000 percaine is injected into the subcutaneous tissue, using from 10 to 15 c.cm. The syringe is then loaded with the hydrochloric acid solution, and as the needle is withdrawn this solution is injected so that it is evenly distributed in the same plane as the percaine. Other workers have used alcohol. Stone gives two or three minims of absolute alcohol through multiple small punctures into the subcutaneous tissue. Buey injects 40 per cent. ethyl alcohol through a long (four-inch) needle from a single posterior puncture, using from 20 to 40 c.cm. The risk of sloughing is considerable in both these methods. For the severe, intractable type of case, in which no local pathology can be found to account for the condition, large doses of the oil-soluble anaesthetics appear to me to give the best results.

Provided every other aspect of the patient's treatment is being or has been carefully carried out, a small dose of *x* rays (half an erythema dose) sometimes greatly benefits the typical intractable case.

3. Operation

Surgical procedures designed to divide the peripheral nerves and undercut the anal and peri-anal skin are only mentioned in order to condemn them; the results are so unsatisfactory that they are seldom if ever worth undertaking.

SURGERY OF THE GALL-BLADDER

PROFESSOR GREY TURNER'S THIRD LECTURE

The third and last of Professor Grey Turner's Lettsomian Lectures on the surgery of the gall-bladder and common bile duct was delivered before the Medical Society of London on March 6. In speaking of the preparation of the patient for operation Professor Turner said that it was the custom to think mostly in terms of the jaundiced patient, but any operation on the gall-bladder was potentially a serious undertaking. The late Lord Moynihan said: "Surgery has been made safe for the patient; let us make the patient safe for surgery." While he could not entirely subscribe to the first part of that aphorism, everyone would agree as to the wisdom of the second. Before any operation on the gall-bladder the patient should be in hospital and receive a certain preparation, the amount and type depending on circumstances. Where any signs of obesity or of trouble from intestinal conditions were evident it was a good thing to get the patient accustomed to the passage of a stomach tube before the operation; this might be valuable in after-treatment, though it was a trying ordeal for the unaccustomed patient.

Preparation of the Patient

It was just thirty-seven years ago in that very room that Mayo Robson laid great stress on the extreme importance of the preparation of the jaundiced patient (his address was reprinted in the *British Medical Journal* of January 18, 1902). Mayo Robson gave calcium chloride by the mouth and rectum. The lecturer saw it so used, but was never quite satisfied that given in that way it was really of great value, but it did point to the necessity for doing something to overcome the risks associated with haemorrhage. It behoved them in every case to have that complication in view. A great many of these jaundiced patients had suffered much pain and had had morphine, and it was important to keep them under observation for some time for the effect of drugs of that kind to be overcome. It should be seen that they had sufficient fluid (not forgetting the natural rather than the unnatural channels), and it was well to pay attention to the condition of the bowel. He believed that the intravenous exhibition of calcium chloride was certainly of value. The use of blood transfusion before or after operation was a recourse which should always be borne in mind. Whether it should be used as a routine was a moot point, but when there was evidence of a haemorrhagic tendency it should never be omitted. It might be wiser in such cases to operate in two stages. In his experience the use of ascorbic acid (vitamin C) had been of some value in particular cases, and he had great hopes of the help to be obtained from vitamin K, which seemed to have striking anti-haemorrhagic properties.

Technique of Operation

Coming to the technique of the operation Professor Turner spoke first of the anaesthetic. He did not believe that it was always necessary to use spinal anaesthesia to get the best results. Local anaesthesia was perhaps contra-indicated in deep jaundice because the actual trauma of the injection provided avenues from which haemorrhages might extend and become serious. The serious haemorrhage that sometimes took away the resistance of these patients was not always in the peritoneal cavity; he had evacuated from the abdominal wall on more than one occasion large masses of blood clot.

Whatever was to be done in the surgery of the upper abdomen, it was important not to be hampered by the want of proper exposure. All that was requisite might perhaps be done with one or other of two incisions—the vertical incision through the rectus muscle associated with the name of Mayo Robson or the oblique incision below the costal margin, which offered certain advantages. If the vertical incision was used he would plead for its upward extension. Surgeons must have been hampered when the vertical

incision fell far short of the costal margin. The Kocher incision gave a very good exposure, not only of the gall-bladder but, more important still, of the structures about the neck of the gall-bladder and on the edge of the lesser omentum necessary for exposure of the common duct. There were modifications of the Kocher incisions which might turn out to be extremely important. He emphasized also the importance of the Mayo Robson position, in which a cushion was placed beneath the loin. Additional help could be obtained from the reversed Trendelenburg position. A thing to avoid was the tendency to put one's hand between the liver and the diaphragm, and especially to pack anything in that position. Patients were much more liable to get pulmonary complications on that side if the diaphragm were interfered with. He thought that people emphasized too much the discomforts of drainage, though he did not want to deny the possible advantages of being able to do without a drain of any sort.

The Common Duct

He stressed the importance of a careful examination of the common duct. The examination should take place while standing on the left of the patient, the fingers of the left hand being passed into the foramen of Winslow. He largely judged the condition of the duct by its appearance. Appearance would often determine whether or not it could be safely left. The exploration of the interior of the common duct was not so easy as it used to be in the old days, when the counsel was that the best probe was the finger. That was still true, but the cases came so much earlier nowadays that the common bile duct would not admit the finger, and it was better, if there was a stone, to use a pair of forceps which could be passed upwards and downwards, seize the stone, and gradually withdraw it. If all the obvious stones in the duct were removed, and it was a question of small fragments which one felt might be there, a good method was to put in a small strand of gauze or tape and pack it down; when this was withdrawn the small fragments of stone would be found entangled. After the removal of the stone from the duct it was always wise to pass a probe—preferably a Lister sound—down into the duodenum.

Surgical injuries of the common bile duct were not rare. He had had to deal with nine such cases, in four of which he himself was responsible for the injury. He wrote to sixteen surgical colleagues on this subject, and fourteen of them replied that they had had the same misfortune on one or more occasions, and every one of them was familiar with other cases. He collected in all particulars of thirty-two cases, in which there were thirteen deaths as a direct or remote result of that accident. Two other surgeons whom he knew had had to deal with no fewer than seventy-one such cases between them. In the small group of cases with which he himself had come into contact one-third had died as an immediate result of the injury, one-third had died as a late result, and one-third had apparently completely recovered after later operative treatment. It was an accident that was far too common, and that might in itself be extremely serious. He discussed various ways in which this accident might happen. Some of his friends had told him that it had happened in what appeared to be the easiest cases for operation. In some cases it occurred with a long mobile common duct, in others when there were anatomical anomalies or pathological difficulties. The surgeon never knew what kind of anomaly he was going to meet. One example was one of the hepatic ducts or the common duct opening directly into the gall-bladder only discovered after cholecystectomy. Sometimes injuries arose through blind clamping, which had been used to arrest haemorrhage, and sometimes as a result of secondary fibrosis in the duct extending from an inflamed gall-bladder.

Some Necessary Precautions

These considerations brought the lecturer back to the technique of cholecystectomy. He believed it was best first to expose the neck, though there were surgeons who stoutly contended that one should begin at the fundus. When they got to the neighbourhood of the cystic duct no removal of the gall-bladder ought to take place until the common duct, the hepatic duct, and the junction of the right and left hepatic duct had been also seen. The gall-bladder should be examined immediately on its removal. It was important to tie the cystic duct and the cystic artery quite separately. He touched briefly on operations of repair for injuries of the common duct. The best plan was to make a direct anastomosis between the stump of the common hepatic duct and the duodenum, but one of the great difficulties was to identify where this stump of the hepatic duct was likely to be. Great help was obtained in this respect by the use of the hypodermic needle. Success in making this anastomosis depended very much upon the largeness of the opening—which should be finger, or even thumb, size. When confronted with a case in which the patient was extremely ill, and in which it had been possible to find the duct only after a long search, it might be well to establish drainage in the first instance rather than to carry the operation to a conclusion which might bring the patient near to death.

Other Conditions

He was rather struck by the fact that injuries of the bile ducts as a result of road or aeroplane accidents were becoming less rare. The surgeon must be on the look-out for such injuries and must have plans for dealing with them. If injuries of parts could not be exposed drainage should be done, remembering that secondary operation was possible. Malignant disease of the gall-bladder was not very frequent. The various forms of it were like malignant disease elsewhere. Treatment was extremely disappointing. In the vast majority of cases there was recurrence, no matter how extensive the operation. He quoted, however, one case which had come within his observation, in which there was malignant disease of the ducts of a papilliferous type. The patient was operated on at the age of 39, and died thirty-four years later without recurrence. So far as the ducts were concerned he thought there had been rather too much pessimism. Not enough attention had been given to the possibility that some form of excision might be productive of success.

Finally he touched upon some congenital anomalies, including congenital atresia of the common duct. Surgical intervention had been carried out with success in some of these cases, and those with experience urged that such intervention should take place at about the age of 2 months. He also mentioned strangulation, torsion, simple tumours, hydatids, etc. He concluded with the remark by R. L. Stevenson: "And what, pathologically looked at, is the human body with all its organs, but a mere bagful of petards?" (*Aes Triplex.*)

A vote of thanks of quite exceptional cordiality was given to Professor Turner for his three lectures, all of which, by the way, had been abundantly illustrated by lantern slides and all of them delivered—each lasting an hour and a quarter—without a single note.

The Ministry of Labour has published a new edition of the pamphlet on *Social Work for Women*, which is one of the series compiled by arrangement with the incorporated associations of headmasters and headmistresses of public secondary schools. The pamphlet sets out in detail the qualifications and training required and the prospects open to girls of secondary school education wishing to make a career in the executive and administrative side of social work, including charity organization, club leadership, housing estate management, industrial, social, and criminal welfare, and factory inspectorships. It may be purchased from H.M. Stationery Office or from any bookseller, price 3d.

THE APPROACH TO MEDICINE

ADDRESS BY LORD HORDER

An address on "The Approach to Medicine" was given by Lord Horder to the members of the Guthrie Society at Westminster Hospital on March 16. He prefaced it with the remark that he had begun to wonder whether anything he could say on this subject was likely to be of service. Medicine in its more popular aspects and more dramatic manifestations was very much in the public eye. It was on the library lists and even on the "flicks." The general public were convinced that they had got right behind the scenes and discovered the real horror of the profession's "back-stage." They could tell the profession more about itself than it could ever find out on its own, except, of course, with the help of still more ex-doctors and ex-medical technicians of all types who had found—but why so late?—that their real vocation was not the practice of medicine but the revelation of what went on in the consulting-rooms—and areas—of Harley Street. Therefore he felt that it was rather brave of him to talk to an audience which probably knew so much more than he did about these revelations and exposures of the doctor as he actually was "by one who was once one."

His own talk, Lord Horder proceeded, would be much more akin to that described in another "best seller"—namely, the *Pilgrim's Progress*. He wanted to talk of the pilgrim—that is, the embryo doctor and the recently hatched doctor—and his progress through a country which had changed a great deal of late. There was much in the traditions and principles of medicine that did not change, but the human mind and the body in their interaction with the rest of the universe were constantly changing, and the human mind and body was the country through which the pilgrim made his way.

General Education of the Student

Lord Horder dealt first with the general education of the medical student. He endorsed the recommendation of the recent conference on the medical curriculum that the study of medical subjects proper—anatomy, physiology, and so on—should not begin before 18. He agreed also that the natural sciences should bulk more largely throughout the whole period of school education. The student was learning important facts upon which his later studies could be grafted, he was developing a laboratory technique, and, more important than either, he was training his power of observation. If only schoolmasters would realize the value of training their pupils to observe they would make a tremendous contribution to the development of their minds and add to the fullness of their lives in after-years.

The general reading of the student at this time would have much to do with determining his attitude to life, yet, in Johnson's phrase, it should not be too meticulously planned. His mind should browse with the unblunted eagerness of youth over history, remembering, as Carlyle said, that history is only the biography of great men; and then, narrowing the field as the interest got more fixed, he could come to the story of scientific medicine and so link himself, without forging the links too closely, with the great past that medicine was able to boast. Then science must be taken in all its aspects, psychology both old and new, biology of course all the time, anthropology and ethnology. These subjects were not as formidable to-day as they used to be, now that appropriate books were not so hard to come by or so grim to decipher. Then, of course, there was the relief of romance, but, time being short, why not the novels that had come to stay rather than an attempt to keep abreast of the weekly or daily reviewer. And there was poetry. Why poetry? Only because words had value, and for the doctor the right use of words was vital.

That brought him to logic; not the disquisitions of the schoolmen, but the principles of reasoning which were essential as the basis for the scientific mind. He used to be asked to give the list of the best books to read in medicine, and he invariably headed it with Jevons's *Primer of Logic*. Clear reasoning with the power of observation were the twin pillars that supported the whole superstructure of medical training, research, and practice. Some attempt to be accurate in observation, some forbearance and clarity in the use of words, a worship almost of the value of exact measurement and careful reasoning, these things constituted the scientific spirit, the spirit which animated the giants of medicine—Harvey, Hunter, Jenner, Pasteur. Sir William Bragg had lately complained of the increase in the number and scope of magazines devoted to research. Even in the field of medicine alone that constituted a serious problem. But the analytical spirit could be applied to this mass of material, and the few grains of wheat sifted from the large amount of chaff, while the same weapon could be used upon the spate of talk which the student almost daily met, and to which, of course, he made full contribution.

The Doctor's Religion and Politics

The pilgrim must now be pictured passing through his more intensive struggle with the secrets of nature as revealed in the structure and functions of the human body. When Hippocrates said that in order to cure the human body it was necesary to have a knowledge of the whole of things he little knew what the modern doctor would be expected to know, or perhaps he might have modified his aphorism. But before proceeding to discuss this phase of his subject Lord Horder touched on two other matters—namely, the doctor's religion and his relation to politics. There need be nothing in any religious beliefs to which the doctor might incline that should prevent him from being a good—or for that matter a bad—doctor. But there was one thing incumbent upon him: he must sturdily resist all attempts by other men's religions to oppose knowledge. Short of this the doctor would always recognize the right of every human being to his own religion and the vital factor that such beliefs might be in the development of both mind and body. "If he is ever intolerant it will be with the extremist, whether the extremist who vows he has the only faith that can save the world, or the extremist, no less fatuous, who vows he has no belief at all."

The relation of medicine to politics called for a few comments. In the undergraduate stage of training the urge of the young man to take his place with the reformer and pioneer should never be discouraged, not even that swing away to the Left which was at times rather violent. It was customary for the elders to decry these youthful enthusiasms, and compare them with the childish ailments through which the young must pass, and from which they emerged reputedly immune. He did not follow that custom. He held that the capacity for enthusiasm was a priceless possession, the willingness to live and if need be to die for a cause. Some of the scorn it was apt to provoke was not seldom tinged with envy.

Nevertheless the doctor must put aside the luxury of his own convictions outside his own sacramental profession. He might not enjoy the luxury of dying for any other conviction than the one which appertained to the good of his patients. It became part of his job to surrender to some extent his private life in order that he should become the one whom all men could trust outside the strife. He was the life man, not the death man; the peace man, not the battle man. If a man took up what was perhaps the last remaining profession that gave real power he should realize that this power was great in proportion as he was impartial and detached. If on consideration he found that he did not possess the capacity to be detached, then he should strike off into one of the many side paths that the study of medicine so amply provided, not remaining too long in the fairway to obstruct the players in the game. This did not mean that the doctor's attitude to society was a negative one. But once he had seriously embarked on

his adult citizenship as a doctor it was the cross benches that were his appropriate place, because sitting there he could hold a watching brief for the common man.

Pre-clinical Studies

Turning to the pre-clinical stage, Lord Horder thought that the motto should be *Respice finem*. Everything should be rigidly excluded which had not got some bearing upon the doctor's work. It was an unfortunate setback when the medical schools decided to put pure anatomists, pure physiologists, and pure chemists at the head of their departments. Each professor quite naturally wished to stake out as big a claim as possible, though the position had been partly redeemed by the closer association of the heads of the pre-clinical departments with their clinical colleagues in the college committee. Take anatomy, for instance. He had always thought that more time should be given to surface markings and contours "in place of elaborate and painstaking dissection of minute nerves and vessels for the show day." He would introduce fuller details of the viscera, especially the thoracic and abdominal viscera. One would think that these were of little importance in disease, that it was a sort of eviscerated body they were going later on to doctor. Much of what was taught afterwards in the operative surgery class might well be demonstrated in the anatomy room. Was it not time that the contribution made by *x* rays to the knowledge of anatomy, especially of the hollow viscera, should be used in pre-clinical studies? For himself he never really knew where the stomach lay or what its shape was until long after he had qualified. He gave a lot of sound advice about it, and some of the patients got well, but it was not because he knew the lie of the stomach.

In the teaching of physiology Lord Horder's criticisms were even more stringent. The transition from the pre-clinical to the clinical stage should be much less abrupt. After all, what was disease but a state of morbid physiology? The functions by which a man lived in health were the same as those through which he expressed his pathological state, and yet the look on the face of the new clinical clerk suggested that he was approaching the patient as if he were a strange animal whom he had never yet met. He was glad to see that the recent report of the curriculum conference recognized the wisdom of what he was saying, but note the cautious choice of words: "*It is believed* that certain rearrangements could be made by concerted action of the teachers so that the course will be harmonized, consecutive, and interesting"; also the naïveté of the further remark that "the relevance of the laboratory methods and careful dissections to his subsequent study of the living body should not be allowed to escape the student's notice."

Teaching of Normal Physiology

Long ago he had advocated that the technique of the various instruments absolutely necessary for the purpose of a routine examination of the various parts of the body should be mastered early in the physiological class-room—he referred to the stethoscope, the laryngoscope, the blood-counting apparatus, and so on. After all, the heart sounds were physiological, and how could they be studied except by auscultation and other methods. It was the same with the breath sounds. He did not know whether the breath sounds were actually listened to or whether the stethoscope was only shown as an exhibit. The trick—for it was a trick—of seeing the vocal cords should be learned as part of the physiological training. It was the same with the retina. The retina was a normal structure, and how did one see the retina except with the ophthalmoscope? Yet if he asked a new clerk to look at the optic disk he took the instrument and excused himself on the ground that he was unfamiliar with it. Yet he knew quite a lot about the theories of colour-blindness, or did when the fear of meeting the question at examination was upon him. How many clerks or dressers started in the wards having had a clear view of the membrana tympani? But they knew all about the minute structure of the organ of Corti. Again, the blood was a normal tissue. Blood cells should be counted as part of the physiological routine, and familiarity with the count should precede clinical instruction.

These examples of the ignorance of the normal at the time of entering the wards and out-patient room did not end with a lack of acquaintance with simple instruments. "Ask a first-time clerk or dresser how man maintains his erect position, and watch his face. Ask him the significance of knee-jerks—a normal thing. Ask him the average weight of an adult male. The student has to rely upon the general information of a Christmas party or the scales on the railway station weighing machines." This lack of preparedness for clinical instruction was such that the student advanced very slowly during the first three or six months of his clinical work.

In exchanging the laboratories and dissecting-room for the wards and out-patient departments the coming doctor should never forget that he was a naturalist and the human animal was his subject. Nature study was therefore of great value. If he were asked what matters in connexion with human beings should be observed he would reply, "Anything and everything." Things that were not important should be observed in order later to be able to observe things that were. The habit of observation must be cultivated and the state of reverie in which the untrained mind spent the greater part of its life must be broken. Such reverie could by discipline and habit be changed into alertness and awareness. Someone had said that we used only one-third of our brain over the ordinary affairs of life. He would regard the estimate as being too liberal.

The Art of Observation

By the time the student entered the wards he would already be observing many things, things at first rather obvious and dissociated. After a time he would find that the things he was observing became not only more subtle but also more systematized, purposeful, synthetic, useful. He would find that things taken together began to make sense, that they made in the full sense of the word a diagnosis. The sound of the patient's breathing, the texture of the skin, the resistance of a muscle, these and many other things registered clearly and with meaning. When the student had achieved facility in observation he did not need to wait until sights and sounds shattered his senses and hammered at the door of his consciousness. He developed mental antennae. He not only made observations without knowing it, but his observations took on a selective character, and he developed the faculty of distinguishing essentials from non-essentials. Clinical instinct was not due to a sixth sense or to psychic power, but to the fact that it was possible to make many observations of which one was largely unconscious and to effect a synthesis of these observations and discard what was inappropriate. The facility for observing the appearances in health enabled one to pick out the unhealthy, to notice the unusual, to be attracted by deviations from the average. He did not use the word "normal," for normality was a concept which brought in a number of theoretical considerations, while the average was a summation of actual experience.

A deviation from the average might be physiological or pathological, but it must be assumed to be the latter until adequate reasons for the contrary were forthcoming. Some deviations from the average were noticed readily, others required training. There was an average complexion, though there might be slight deviations from the average which required a great deal of experience to detect. There was an average gait, an average method of sitting on a chair or lying in bed, an average way of saying good morning or shaking hands. If there were not an average behaviour how would the bachelor, the spinster, and the only child be recognized?

The value of recognizing slight deviations from the average was seen in the early stages of a number of diseases which, but for this training, might be unsuspected for some time. He need mention only myxoedema, Graves's disease, chorea, nephritis, general paresis, and Parkinsonism; but, of course, faces must be observed also for expression—the expression of pain, physical or mental, recent or of long standing, the expression of happiness or unhappiness, and the feigning of either, and especially the expression of anxiety and fear. All this enabled one to test the things the patient said, to test his account of the agonizing pain, the sleepless nights, the days and weeks of so little food that it was a wonder he was alive—yes, but also to test the person who said, "My mind is completely at ease," when it was evident from the facies that it was very much otherwise. Of course, they must put the patient on the couch and on the scales, but they must look at the face, and, having become sensitive to deviations from the average, they could learn very much. It was frequently borne in upon them that the person they were in contact with did not conform to the average, but for the moment they could not say in what way.

> You are not average, Mr. Ell;
> The reason why I cannot tell,
> But this alone I know full well,
> You are not average, Mr. Ell.

By this kind of mental discipline some doctors developed a power that unthinking folk called uncanny. It was not really uncanny. The legerdemain of the prestidigitator was just as "uncanny." It meant that they became experts. They possessed a power which the layman had not got. If this were not so the layman's idea of health would be as sound as the doctor's. Mere industry, whether with books or instrumental technique, useful as most of these were, could never supply the kind of wisdom that medicine really demanded.

The Examination

Finally, Lord Horder touched upon the student's *bête noire*—his examinations. He associated himself with those who said that examinations were of themselves a curse. The cramping effect they had upon the student's mind was all too obvious, and this paralysing effect was more marked in the main upon the good and intelligent student than upon the lazy and stupid. One often saw a wild and reckless abandon about the lazy student in the examination room which suggested knowledge and facility, and if he had a certain amount of luck it was quite a useful asset, whereas the good man was often other than himself through fear, so that it was not always easy to decide that he was not stupid. What did matter was that during the greater part of his time of preparation for examinations he was prevented from being "wax to receive and marble to retain." When he himself was trying to familiarize the student with some important physical sign he was not unaccustomed to find that the student was not only incapable of giving him his active attention, but was even awkward in his use of the stethoscope, the reason being that he was holding his synopsis of medicine under his arm.

What could be done about this? Several things could be done. One was that examinations, if they must have them, should be got over in all subjects except the finals as soon as the student was able to pass them. In the case of many diligent students this would free them for their pathological and clinical work at an earlier period. He would have greater freedom and wider choice at the examinations themselves and more time to answer questions. It would be well to publicize the fact that clear thinking rather than the memorizing of the synopsis was likely to secure a pass—but perhaps the authors of the synopsis were also among the examiners!

"It has fallen to my lot to welcome back to the wards the pupil who has just completed his Finals, but it is sometimes not immediately apparent who he is. He has become a little more careful with his clothes and hair, but the great transformation is physiognomic. His anxiety neurosis has been cured. He is now a rational being. The channels of his senses are open and he observes. The Pilgrim has finished his Progress, and the approach to medicine has been completed."

EMERGENCY HOSPITALS SCHEME FOR LONDON

GROUPING FOR CASUALTIES

Details of a scheme whereby hospitals in the London area will be grouped in sectors for the treatment of casualties in time of war have now been sent to the hospital authorities concerned by the Ministry of Health.

The scheme, which is subject to modification, is based on the affiliation of certain casualty hospitals in the more dangerous areas to others in outer areas. In London this affiliation is arranged in ten sectors radiating from the centre. Each of these sectors contains voluntary and municipal hospitals of widely differing types, including the great teaching hospitals, local authority institutions, mental hospitals, specialized hospitals, cottage hospitals, etc.

The great teaching hospitals in Central London, the larger municipal hospitals, and some others already possess the personnel and equipment necessary for dealing with casualties on a large scale. Other hospitals and institutions (such as some mental hospitals) have adequate accommodation, and can be cleared of their normal patients and "upgraded" to the status of casualty hospitals in time of emergency by the installation of additional apparatus and personnel. Other hospitals, which could not be so "upgraded," would be kept for the reception of convalescent cases, chronic cases, and those needing in-patient treatment but not requiring any special facilities.

Evacuation Outwards

It is proposed that the casualty hospitals near the centre of each sector should be used as far as possible for immediate treatment only, and that the injured should be transferred at the earliest opportunity from the centre to affiliated casualty base hospitals in the outer areas. Thus in Sector VII, St. George's Hospital, Hyde Park Corner, is affiliated to (among others) an advance base hospital at Staines in Middlesex (the Public Assistance Institution) and a base hospital at Basingstoke in Hampshire (the Park Prewett Mental Hospital).

The evacuation of casualties would probably be outwards, but owing to the unpredictable nature of air attack it might on occasion be necessary to give casualties initial treatment at an outlying hospital, and then to redistribute them among hospitals nearer the centre. Elasticity and freedom of interchange between hospitals are the essence of the scheme, which is designed so far as possible to distribute the weight of casualties falling suddenly at any given point.

The Group Officers

As already announced, the following Group Officers for the ten sectors of the London area have been appointed:

Sector I: Sir Girling Ball, St. Bartholomew's Hospital, Mr. C. A. Joll, Royal Free; *Sector II:* Mr. Norman Lake, Charing Cross, Dr. Wilfred J. Pearson, University College; *Sector III:* Mr. E. Rock Carling, Westminster, Mr. C. H. S. Frankau, St. George's; *Sectors IV and V:* Mr. Russell Howard, London Hospital; *Sector VI:* Professor T. B. Johnston, Guy's; *Sector VII:* Mr. C. Max Page, St. Thomas's; *Sector VIII:* Dr. H. E. A. Boldero, Middlesex; *Sector IX:* Sir Charles Wilson, St. Mary's; *Sector X:* Mr. John B. Hunter, King's.

Hospitals in Each Sector

The following lists show the hospitals grouped according to sectors. Those with an asterisk will be used as the principal casualty hospitals, the remainder will be kept for minor casualties, convalescents, infectious diseases, chronic cases, etc.

Sector I (Essex)

Barkingside, Australasian (Barnardo's) Hospital* ; Walthamstow, Connaught Hospital* ; East Ham Memorial Hospital* ; Ilford, King George Hospital* ; Romford, Oldchurch County Hospital (Essex C.C.)* ; Stratford, Queen Mary's Hospital* ; Plaistow, St. Mary's Hospital* ; Tilbury, Seamen's Hospital* ; Walthamstow, Whipps Cross Hospital (West Ham C.B.)* ; Woodford Jubilee Hospital* ; Barking Hospital (Barking M.B.)* ; Brentwood, Highwood L.C.C. Hospital* ; Albert Dock Hospital* ; Snaresbrook, Alderbrook Children's Home (East Ham C.B.)* ; Hornchurch, Sutton's Institution (Auxiliary to Oldchurch H.P.) (E.C.C.)* ; West Ham Hospital, Harold Wood (W. Ham C.B.)* ; Chelmsford, St. John's P.A.I. (E.C.C.)* ; Colchester P.A.I. (E.C.C.)* ; Braintree, Black Notley Sanatorium (E.C.C.)* ; Colchester, Essex County Hospital* ; Chelmsford and Essex Hospital* ; Rochford, Southend Municipal Hospital (Southend C.B.)* ; Southend District General Hospital* ; Brentwood Mental Hospital (Essex and Colchester B.)* ; Goodmayes Mental Hospital (W. Ham C.B.)* ; Runwell Mental Hospital (E. Ham and Southend C.B.s)* ; Claybury Mental Hospital (L.C.C.)* ; Severalls Mental Hospital (Essex and Colchester B.)* ; Brentwood District Hospital ; Woodford Green, Brookfield Orthopaedic (E.C.C.) ; Buckhurst Hill, Forest Hospital ; Plaistow, Balaam Street Children's Hospital ; Romford Victoria Hospital ; Ongar District Cottage Hospital ; Ongar War Memorial Hospital ; Epping and District Cottage Hospital ; Halstead Cottage Hospital ; Braintree Courtauld Hospital ; Woodford Bridge, Hanbury Hospital ; Braintree P.A.I. (E.C.C.) ; Grays, Orsett P.A.I. (E.C.C.) ; Stanway, Nr. Colchester, P.A.I. (E.C.C.) ; Maldon St. Peter's P.A.I. (E.C.C.) ; Forest Gate P.A.I. (W. Ham C.B.) ; Harold Wood, Harold Court Sanatorium (E.C.C.) ; Woodford Green, Harts Sanatorium (E. Ham C.B.) ; Dagenham, West Ham Sanatorium (West Ham C.B.) ; Loughton High Beach Sanatorium (Ch.) ; Warley Marillac Sanatorium ; Nazeing, Princess Louise Convalescent Home ; Hutton, Nr. Brentwood, Mothers' Convalescent Home ; Laindon, West Ham Sanatorium (Ch.) (W. Ham C.B.) ; Benfleet, Canvey Island, Friends Convalescent Home ; Chelmsford, Merivale Sanatorium ; Leytonstone Central Home P.A.I. (W. Ham C.B.) ; Chigwell, Great West Hatch P.A.I. (E.C.C.) ; Chigwell, Hainault Lodge Chronic P.A.I. (Essex C.C.) ; Goodmayes, Little Heath House Chronic P.A.I. (Essex C.C.) ; Brentwood, St. Faith's (L.C.C.) ; Ongar, Fyfield Open Air School (Ch.) (W. Ham C.B.) ; Ilford Borough Maternity Hospital (Ilford M.B.) ; Plaistow Maternity Hospital (W. Ham C.B.) ; Walthamstow, Thorpe Coombe Maternity Home (Walthamstow M.B.) ; Colchester Maternity Hospital (Colchester Town Council) ; Barking Upney Maternity Hospital (Barking M.B.).

Advanced Bases : Epping P.A.I. (E.C.C.)* ; Billericay, St. Andrew's P.A.I. (E.C.C.).*

Sector II (London Hospital)

London Hospital, E.1* ; German Hospital, E.8* ; Metropolitan Hospital, Kingsland Road, E.8* ; Bethnal Green L.C.C.* ; London Chest, Victoria Park, E.2* ; St. Leonards L.C.C.* ; St. Leonards Hp. II L.C.C. ; St. Peter's L.C.C.* ; Mile End L.C.C.* ; St. Andrew's L.C.C.* ; London Jewish, Stepney Green, E.1* ; Poplar Hospital, East India Dock Road, E.14* ; Princess Elizabeth of York Hospital, Shadwell, E.1* ; St. George's-in-the-East L.C.C.* ; Mildmay Mission, Bethnal Green, E.2* ; Queen's for Children, Hackney Road, E.2 ; N. Eastern, S. Tottenham, N.15, L.C.C.* ; Eastern, Homerton, E.9, L.C.C.* ; Hackney L.C.C.* ; Hackney Hp.II L.C.C. ; Prince of Wales, Tottenham, N.15* ; Groveland Recovery Home, N.14 ; Home Hp., Stoke Newington, N.16 ; Mildmay Memorial Hospital, N.1 ; Enfield War Memorial* ; Enfield House P.A.I. (M.C.C.)* ; Chase Farm, The Ridgeway, Enfield (M.C.C.)* ; N. Middlesex County Hp., Silver Street, N.18 (M.C.C.)* Enfield I.D. (Town Council)* ; Northern Fever L.C.C.* ; Potters Bar Cottage ; Bishops Stortford P.A.I. (H.C.C.)* ; Bishops Stortford General* ; Hitchin, N. Herts and S. Beds Hp.* ; Hitchin, Chalkdell P.A.I. (H.C.C.)* ; Hertford County Hp.* ; Royston Hp. ; Letchworth Gen. Hp. ; Welwyn Victoria Memorial Hospital ; Welwyn Garden City Cottage Hospital ; Cheshunt Cottage Hospital ; Waltham Cross Abbey Memorial Hospital ; St. David's L.C.C. ; White Webbs P.A. Home, Enfield (M.C.C.) ; Jewish Maternity, E.1 ; St. Clement's, E., L.C.C. ; Salvation Army, N.E. ; Hitchin, German Convalescent Home ; Hatfield, Welfield P.A.I. (H.C.C.) ; Ware County Sanatorium (H.C.C.) ; Royston Casual Wards (H.C.C.) ; Bayford, Spring House Nursing Home ; Ware Western House P.A.I. (H.C.C.).

Advanced Base : South Mimms Sanatorium (M.C.C.).*

Base Hospital for Sectors II, III, IV, and V : Bedford Mental Hospital, Arlesey.*

Sector III (Bart's and Royal Free Hospitals)

St. Bartholomew's* ; Royal Free* ; London Fever Hospital, Islington, N.1* ; Chest Hospital, Victoria Park, E.2* ; Central London Throat, Nose and Ear Hospital, Gray's Inn Road, W.C.1 ; St. Mark's, City Road, E.C.1 ; Royal London Ophthalmic Hospital, City Road, E.C.1 ; St. Mary Islington L.C.C.* ; Highgate L.C.C.* ; Archway L.C.C.* ; Royal Northern, Holloway Road, N.7* ; Hornsey Central* ; Finchley Memorial Hospital* ; Wood Green and Southgate ; Finchley I.D. (Joint Hospital Board)* ; Colney Hatch Mental Hospital (L.C.C.)* ; Barnet Victoria Hospital* ; St. Albans, Oster H. P.A.I. (H.C.C.)* ; Cell Barnes Mental Hospital* ; St. Albans & Mid Herts Hospital ; Luton and Beds Hospital* ; Luton Poor Law Institution* ; Nervous Diseases Hospital, Woodside Avenue, N.10 ; N. Islington Welfare Centre ; St. Matthew's, N.1, L.C.C. ; Harpenden Children's Sanatorium ; Hadley Wood, Pawling Home ; New Barnet, Rosa Morison House ; Barnet Gate, Winifred House ; Shenley, Lyndhurst Private Nursing Home ; City of London Maternity, City Road, E.C.1.

Advanced Bases : Wellhouse P.A.I. (H.C.C.)* ; Shenley Mental Hospital (Mdx.C.C.).*

Base Hospital for Sectors II, III, IV, and V : Bedford Mental Hospital, Arlesey.*

Sector IV (University College and Charing Cross Hospitals)

University College Hospital* ; Charing Cross* ; National Temperance Hospital, Hampstead Road, N.W.1* ; Elizabeth Garrett Anderson Hospital, Euston Road, N.W.1* ; Italian Hospital, Queen Square, W.C.1* ; Homoeopathic, Gt. Ormond Street, W.C.1* ; St. John and St. Elizabeth Hospital, N.W.8* ; St. Pancras L.C.C.* ; St. Pancras II L.C.C. ; French Hospital, Shaftesbury Avenue, W.C.2* ; Royal National Orthopaedic, Gt. Portland Street, W.1* ; Gt. Ormond St. Hospital* ; Florence Nightingale Hospital, Lisson Grove, N.W.1 ; St. Saviour's Hospital, Osnaburgh Street, N.W.1 ; Hospital of St. Luke, Fitzroy Square, W.1 ; Metropolitan E. N. and T. Hospital, Fitzroy Square, W.1 ; Hospital for Women, Soho Square ; Golden Square E. N. and T. Hospital, W.1 ; Central London Ophthalmic Hospital, Judd Street, W.C.1 ; Royal Westminster Ophthalmic Hospital, High Holborn, W.C.1 ; St. Peter's for Stone, Henrietta Street, W.C.2 ; St. Paul's, Endell Street, W.C.2 ; Hampstead General, N.W.3* ; Hendon Cottage* ; Hendon I.D. (Joint Hospital Board)* ; Manor House, Golder's Green, N.W.11* ; New End L.C.C. Hospital, Hampstead, N.W.3* ; North-Western L.C.C.* ; Marie Curie Hospital, N.W.3 ; Hampstead Children's, N.W.3 ; Colindale L.C.C.* ; Redhill County (Mdx.C.C.)* ; Stanmore Cottage ; Watford Peace Memorial Hospital* ; Hemel Hempstead W. Herts Hospital* ; Hemel Hempstead P.A.I. (H.C.C.)* ; Stanborough Hydro, Watford* ; Bushey Heath District Hospital ; St. Columbus, N.W.13 ; Hospital for Epilepsy, Maida Vale, W.9 ; Queen Charlotte's, Marylebone Road, N.W.1 ; National Heart Hospital, Westmoreland Street, W.1 ; West End Hospital for Nervous Diseases, Welbeck Street, W.1 ; St. John's Skin Hospital, W.C.2 ; Hospital for Tropical Diseases, Gordon Street, W.C.1 ; National Nerve Hospital, Queen Square, W.C.1 ; Sheffield Street, W.C.2, L.C.C. ; Bushey and Middlesex County Maternity Hospital ; St. Margaret's, Kentish Town ; Redhill P.A.I. (Mdx.C.C.) ; Redhill Men's Homes (Mdx.C.C.).

Advanced Bases : Watford P.A.I. (H.C.C.)* ; Royal National Orthopaedic* ; Royal National Training College, Stanmore.*

Base Hospital for Sectors II, III, IV, and V : Bedford Mental Hospital, Arlesey.*

Sector V (Middlesex Hospital)

Middlesex* ; Paddington L.C.C. General, Harrow Road, W.9* ; Paddington Green Children's, W.2 ; Western Ophthalmic Hospital, Marylebone Road, N.W.1 ; Samaritan Free Hospital for Women, Marylebone Road, N.W.1 ; Radium Institute, Riding House Street, W.1 ; Harrow General* ; Wembley General* ; St. Andrew's, Dollis Hill* ; Willesden I.D. (Joint Hospital Board)* ; Willesden General* ; Northwood and Pinner ; Royal Bucks, Aylesbury* ; Aylesbury P.A.I. (Bucks C.C.)* ; Chesham Cottage Hospital ; Tring, Champreys Nature Home ; St. Monica's (Willesden Chest Hospital) ; London Lock.

Advanced Base : Mount Vernon, Northwood.*

Base Hospital for Sectors II, III, IV, and V : Bedford Mental Hospital, Arlesey.*

Sector VI (St. Mary's Hospital)

St. Mary's* ; Hammersmith L.C.C., Ducane Road, W.12* ; Acton General, W.3* ; St. Charles's L.C.C., St. Charles Square, W.10* ; Hayes Cottage, Grange Road, Hayes, Middlesex ; Southall-Norwood, Southall, Middlesex ; Hanwell Cottage Hospital, W.7 ; Ealing I.D. (Joint Hospital Board)* ; St. Vincent's Orthopaedic, Eastcote, Middlesex* ; Central Middlesex, Willesden, N.W.10 (Mdx. C.C.)* ; Uxbridge ; Princess Louise, Kensington, Hospital for Children, N.W.10 ; Harlington Cottage Hospital ; Amersham P.A.I. (Bucks C.C.)* ; High Wycombe Memorial Hospital* ; Gerrards Cross Hospital ; Hanwell Mental Hospital, L.C.C.* ; St. Luke's Hospital, Hereford Road, W.2 ; Young Convalescent Home, Castlebar Hill, Ealing, W. ; Uxbridge Convalescent Home (Mdx. C.C.).

Advanced Bases : Hillingdon County (Mdx. C.C.)* ; Hillingdon P.A.I. (Mdx. C.C.)* ; Harefield Sanatorium (Mdx. C.C.).*

Base Hospital for Sectors VI, VII, and VIII : Park Prewett Mental Hospital, Basingstoke.*

Sector VII (St. George's and Westminster Hospitals)

St. George's* ; Westminster* ; Western L.C.C., S.W.6* ; Princess Beatrice, S.W.5* ; St. Stephen's L.C.C., S.W.10* ; St. Mary Abbots, W.8* ; St. Mary Abbots Hp. II ; St. Luke's L.C.C., S.W.3* ; Brompton Hospital, S.W.* ; West London, W.6* ; Royal Cancer, S.W.3 ; Chelsea Hospital for Women, S.W.3 ; Cheyne Hospital for Children, S.W.3 ; Victoria Children's Hospital, Tite Street, S.W.3 ; Gordon Hospital, Vauxhall Bridge Road, S.W.1 ; Grosvenor Women's Hospital, Vincent Square, S.W.1 ; Infants Hospital, Vincent Square, S.W.1 ; Fulham Hospital, S.W.6* ; Fulham Hospital II, S.W.6 ; Royal Masonic, W.6* ; Hounslow General* ; Staines I.D. (U.D.C.)* ; Staines Cottage ; Hampton Cottage ; Teddington ; St. John's, Twickenham ; Brentford and Chiswick ; Chiswick General ; S. Middlesex I.D. (Joint Hospital Board* ; W. Middlesex County, Isleworth (Mdx.C.)* ; Isleworth P.A.I. (Mdx.C.)* ; Isleworth Casual Wards (Mdx.C.C.)* ; Ealing General* ; Windsor P.A.I. (Berks C.C.)* ; King Edward VII, Windsor* ; Slough P.A.I. (Bucks C.C.)* ; Iver Cottage Hospital ; Basingstoke P.A.I. (Hants C.C.)* ; Maidenhead Voluntary Hospital* ; Maidenhead Institution (Berks C.C.)* ; Park Prewett Mental Hospital, Basingstoke* ; Queen Charlotte's, Goldhawk Road ; Westminster Institution ; Chelsea Institution ; St. George's Home, Milman's Street, S.W.10.

Advanced Base : Staines P.A.I. (Mdx.C.C.).*

Sector VIII (St. Thomas's Hospital)

St. Thomas's* ; Lambeth L.C.C.* ; Battersea, S.W.11* ; South Western, S.W.9, L.C.C.* ; St. John's, Clapham Junction, L.C.C., S.W.11* ; Bolingbroke, Wandsworth Common, S.W.11* ; Royal Waterloo, S.E.1 ; Evelina Hospital, S.E.1 ; Catholic Nursing Institution, S.E. ; All Saints, S.E.11 ; Belgrave for Children, Clapham Road, S.W.9 ; Weir Hospital, Balham, S.W.12 ; St. James, Balham, L.C.C., S.W.12* ; South London Women's, Clapham Common, S.W.4* ; Grove Hospital, Tooting Grove, S.W.17, L.C.C.* ; Putney, S.W.15* ; Queen Mary's Hospital, Rochampton, S.W.15 (Ministry of Pensions)* ; Nelson, Merton Park, S.W.20* ; Wimbledon General, S.W.* ; Kingston County (S.C.C.)* ; Victoria, Kingston* ; Star and Garter, Richmond* ; Royal Hospital, Richmond* ; Richmond P.A.I. (S.C.C.)* ; Surbiton* ; Wilson, Mitcham, Surrey* ; Guildford, Royal Surrey* ; St. Anthony's, Cheam* ; Schiff Home, Cobham* ; Southern Orphanage, Woking* ; Sutton and Cheam General* ; Guildford Institution (S.C.C.)* ; Weybridge General* ; Gordon Boys' Home, Woking* ; Victoria Hospital, Woking* ; Farnham Institution* ; St. Nicholas Orthopaedic, Pyrford* ; Clandon Small-pox Hospital (S.C.C.)* ; Godalming, Surrey County Sanatorium (S.C.C.)* ; Godalming, King George V Sanatorium (L.C.C.)* ; Frimley and Camberley ; Hampton Court Cottage Hospital ; Thames Ditton Cottage ; Walton-on-Thames Cottage ; Walton-on-Thames Maternity Home ; Windlesham Cottage ; Cobham and District ; Farnham, Trimmers Cottage ; Haslemere Hospital ; Wokingham P.A.I. (Berks C.C.)* ; Ascot, Heatherwood H.P., L.C.C.* ; Wokingham, Pinewood Sanatorium, L.C.C.* ; Botleys Park Mental Hospital, Chertsey* ; Royal Eye Voluntary Hp., S.E.1 ; St. Thomas's Babies, S.E.11 ; Annie McCall Maternity, S.W.4 ; St. Benedict's L.C.C., Church Lane, S.W.17 ; Walton-on-Thames Met. Con. ; Cheam Sanatorium ; Woking, St. Peter's Convalescent Home ; Kingston Institution (S.C.C.) ; Frimley Sanatorium ; Godalming, Meath Epileptic Home ; Haslemere, Holy Cross Sanatorium ; Witley, St. Dominics Open Air School ; Wimbledon, Morey's Convalescent Home ; Frimley, Burrow Hill Sanatorium ; Worcester Park Private Nursing Home ; Morden Grange Nursing Home ; Worcester Park, Briarwood Nursing Home ; Byfleet, Clock House Private Nursing Home ; Egham Cottage Hospital ; Surbiton, Old Surbiton Hospital ; Camberley, Prior Place Private Sanatorium ; Guildford Ch. Home (S.C.C.) ; Farnham, Tilford Ch. Home ; Mitcham, Cumberland House (S.C.C.) ; Farnham Homes for Aged (S.C.C.) ; Mt. Alvenia Nursing Home, Guildford ; Woking Maternity Home ; General Lying-In.

Advanced Base : Brookwood Mental Hospital.*

Base Hospital for Sectors VI, VII, and VIII : Park Prewett Mental Hospital, Basingstoke.*

Sector IX (King's College Hospital)

King's College* ; St. Giles L.C.C., S.E.5* ; Dulwich L.C.C.* ; Norwood Children's Hospital, L.C.C., S.E.* ; South-Eastern Children's, Sydenham* ; Norwood and District Cottage ; Croydon General* ; Mayday, Croydon (Croydon C.B.)* ; Carshalton and District* ; Queen Mary's Children's, Carshalton, L.C.C.* ; Beckenham Hospital* ; Bromley and District* ; Bromley, Phillips Memorial ; Purley General* ; Redhill Co. P.H. Hospital (Surrey C.C.)* ; Radcliffe Convalescent Home, Limpsfield* ; East Surrey Hospital, Redhill* ; Epsom County P.H. (Surrey C.C.)* ; Epsom P.A.I. (Surrey C.C.)* ; Royal Blind School, Leatherhead* ; Surrey County Hospital, Dorking (Surrey C.C.)* ; Dorking and District Hospital* ; Banstead, Castleton Nursing Home ; Caterham and District Hospital ; Epsom and Ewell ; Leatherhead General ; Oxted and Limpsfield Cottage ; East Grinstead Victoria Cottage Hospital ; Cranleigh Cottage Hospital ; Horley Cottage Hospital ; Hayward's Heath, King Edward VII* ; Cuckfield Institution (E. Sussex C.C.)* ; Horsham Institution (W. Sussex C.C.)* ; Netherne Mental Hospital (Surrey C.C.)* ; Hayward's Heath Mental Hospital, Brighton (Brighton C.B.)* ; Norwood Children's Home, L.C.C. ; St. Francis L.C.C. Hospital for Chronic Sick ; Limpsfield, Caxton Convalescent Home ; Croydon, Queen's Road (Croydon C.B.) ; Ewell Park P.H. Con. (Surrey C.C.) ; Reigate, Croft Convalescent Home ; Reigate, Marie Celeste Annexe ; Redhill, St. Anne's P.A.I. (Surrey C.C.) ; Leatherhead Cripples Training College ; Sutton Training College L.C.C. ; West Wickham, Children's Heart Hospital ; Beckenham, Coney Hill Home ; Hambledon Institution (Surrey C.C.) ; Lingfield Epileptic Colony ; Croydon Children's Homes (Croydon C.B.) ; Tadworth, Gt. Ormond St. branch ; Sutton, Downs L.C.C. Hospital ; Reigate, Castlebridge Nursing Home ; Chipstead, Shabden Park Home (Surrey C.C.) ; Walton Heath, Osteopathic Hydro ; South Croydon, Coombe Cliff Home (Croydon C.B.) ; Croydon, Arundel Lodge Home ; Croydon Nursing Home Ltd. ; Redhill, Denmark Nursing Home ; Croydon, Lynton Nursing Home ; South Croydon, Malatia Private Nursing Home ; Sanderstead, Purleybury Nursing Home ; Croydon, St. Mary's Maternity Hospital (Croydon C.B.) ; South Norwood, Retreat Maternity Home ; Sutton, Woodside Maternity Home.

Base Hospital for Sectors VIII and IX : Horton Mental Hospital, Epsom, L.C.C.*

Sector X (Guy's Hospital)

Guy's* ; St. Olave's L.C.C., S.E.* ; Bermondsey Medical Mission, Grange Road, S.E.1 ; St. John's, Lewisham, S.E.13* ; Miller Hospital, Greenwich, S.E.10* Lewisham Hospital, L.C.C., S.E.* ; Dreadnought Hospital, Greenwich, S.E.10* ; St. Alfege's Hospital, Greenwich, L.C.C., S.E.10* ; St. Alfege's Hospital II, Greenwich, L.C.C., S.E.10 ; St. Nicholas, Plumstead, L.C.C., S.E.18* ; Brook Hospital, Shooter's Hill, L.C.C., S.E.18* ; Park Hospital, Hither Green, S.E.13* ; Grove Park Hospital, L.C.C., S.E.12* ; Woolwich War Memorial Hospital, S.E.18* ; South-Eastern Fever, L.C.C., New Cross, S.E.* ; Eltham and Mottingham ; Blackheath and Charlton ; Sittingbourne Mental Hospital ; Edenbridge War Memorial Hospital ; Erith and District ; Bexley Cottage Hospital ; Sevenoaks General* ; Kent Co. Eye Hospital, Maidstone* ; Preston Hall Hospital, Maidstone* ; West Kent General, Maidstone* ; Joyce Green, Dartford, L.C.C.* ; Orchard, Dartford, L.C.C.* ; Orpington P.A.I. (K.C.C.)* ; Queen Mary's, Sidcup, L.C.C.* ; Dartford Co. Hospital (L.C.C.)* ; Livingstone Hospital, Dartford* ; Gravesend and N. Kent Hospital* ; Chatham Co. (K.C.C.)* ; St. Bart's, Rochester* ; Tunbridge Wells General* ; Tunbridge Wells Homoeopathic* ; Tonbridge Cottage ; Southern Hospital, Dartford (L.C.C.)* ; David Solomons Home, Southborough (K.C.C.)* ; West Malling P.A.I. (K.C.C.)* ; Bexley Mental Hospital, L.C.C.* ; Barming Heath Mental Hospital, Maidstone (Kent and Gravesend B.)* ; Warlingham Mental Hospital, Whyteleafe, Surrey (Croydon C.B.)* ; Woolwich Institution, S.E., L.C.C. ; Ladywell Institution, L.C.C. ; Albany Deptford Babies Hospital, Breakspears Road, S.E.4 ; Hospital for Mothers and Babies Vo. Mat., S.E. ; Goldie Leigh Ch., L.C.C., Abbey Wood, S.E.2 ; Coxheath (Maidstone) P.A.I. (K.C.C.) ; Sevenoaks P.A.I. (K.C.C.) ; Cranbrook P.A.I. (K.C.C.) ; Swanley, Alexandra Ch. Orthopaedic Hospital ; Swanley, White Oak Ophthalmic Hospital (L.C.C.) ; Gravesend Sanatorium ; Gravesend P.A.I. (K.C.C.) ; Lenham County Sanatorium (K.C.C.) ; Benenden Sanatorium ; Sittingbourne P.A.I. (K.C.C.) ; Sevenoaks Ch. Orthopaedic Hospital ; Chislehurst Cottage Hospital ; Sidcup Cottage Hospital ; Tunbridge Wells, Hawkesbury Convalescent Home ; Hawkhurst Cottage Hospital ; Wrotham, Cecill Cragg Hospital ; Cranbrook Convalescent Home (K.C.C.) ; Sittingbourne Ch. Home ; Bexley Maternity Home ; Gillingham, Royal N. and M. Maternity Home ; Erith, Hainault Maternity Home.

Advance Base : Farnborough Hospital, Kent (K.C.C.).*

Base Hospital for the time being for Sector X : Pembury Co. Hospital, nr. Tunbridge Wells (K.C.C.).*

The sixth European Mental Hygiene Reunion will take place, under the auspices of the Swiss National Committee for Mental Hygiene, at Lugano, Switzerland, from June 4 to 6, following the conference of the Swiss psychiatric and neurological societies which will be held during the preceding two days. The main theme of the discussions will be "Mutual Understanding and Mental Hygiene." Speakers from different parts of Europe will contribute papers, including Dr. Emanuel Miller and Dr. Gerald R. Hargreaves of London. Morning and afternoon sessions will be held, and a number of social events have also been arranged. As the reunion will take place during the time of the Zurich Exhibition a reduction of 50 per cent. on the Swiss railway fares will be allowed to those attending on condition that they also visit the exhibition. The fee for the reunion has been fixed at 5 Swiss francs, and special terms have been arranged for those staying at the Park Hotel, Lugano, where the reunion will take place. Those who wish to enrol are asked to communicate with the secretary, National Council for Mental Hygiene, 76, Chandos House, Palmer Street, London, S.W.1, who will also furnish full particulars regarding the programme and arrangements.

THE DAHLEM INSTITUTES OF THE KAISER-WILHELM GESELLSCHAFT

[FROM A CORRESPONDENT]

International co-operation in science, which managed to survive the world war, has in recent years been threatened by the increasing stresses in European politics. It is pleasant to record that a definite step for the preservation of these relations has been taken by the Kaiser-Wilhelm Gesellschaft of Germany, which has arranged with our Royal Society an interchange of visits between scientists of the two countries. The writer of this note recently had the privilege of visiting Berlin in accordance with that arrangement, and stayed at the Harnack Guest House, which is in the centre of a group of institutes maintained by the Kaiser-Wilhelm Gesellschaft at Dahlem.

A Centre of Research

This organization maintains no fewer than thirty-two institutes, but the six institutes at Dahlem are perhaps the most important single group, and, as regards size and numbers, it is comparable to a small university. This comparison fails, however, to indicate its importance as a centre for research. The conditions are ideal for research, since the workers can devote their whole time to the advancement of knowledge without the distractions of teaching and of academic business; furthermore, the institutes have magnificent equipment and are much better supplied with technical assistants than is the usual university department. By reason of these advantages the institutes attract the best brains of the country. Hence they constitute the most active centre of research in Germany, and indeed there are few other centres in the world that can show a comparable activity.

The Dahlem group comprises institutes for physics, chemistry, physical chemistry, biochemistry, cell physiology, and biology. Hence they cover an important fraction of the sciences fundamental for medicine, whilst more strictly medical subjects are dealt with in institutes in other parts of Germany—for example, Institute for Medical Research (Heidelberg), Institute for Brain Research (Buch, near Berlin), Institute for the Physiology of Work (Dortmund).

The research activity at Dahlem is too varied and extensive to permit of any short description, but it is interesting to note how much attention is being paid to the growth-regulating hormones of plants and animals. A new field of hormonic control is being now revealed, since it would appear that there exists a system of tissue products which act locally as growth regulators. The possible interest of such substances in relation to the causation of malignant growth is obvious.

Two Contrasting Policies

The Dahlem Institutes represent an interesting development in scientific research. In Great Britain, research in biological sciences has developed chiefly in connexion with teaching in the universities and medical schools. The general trend of modern research is, however, towards increasingly elaborate and expensive apparatus, and hence the question arises as to the wisdom of putting such apparatus under the control of persons who can only devote a part of their time to research. In this country only a few biological institutes have developed, and these tend to be isolated and hence lack the stimulus that is provided by contact with workers in related fields of science.

The Dahlem group was founded nearly thirty years ago, and the record of the research it has produced provides impressive support for the general policy of the Kaiser-Wilhelm Gesellschaft. It is of course true that an arrangement which suits one country, or indeed one science, may not be suitable for others. The Dahlem

group, however, provides evidence that it is possible for research institutes to maintain a very high standard of activity for a prolonged period, and this is a fact of great interest in regard to the possible future developments of biological sciences.

As regards the personal aspect of the visit, the writer was chiefly impressed by the warmth and thoughtfulness of the hospitality extended to him, both by his direct hosts and by all the institutions he visited. It can only be hoped that our German guests when they come to this country will have equally enjoyable visits.

March 8, 1939.

SCHLESINGER RESEARCH FELLOWSHIP

The Medical Research Council invites applications for the Kathleen Schlesinger Research Fellowship. This Fellowship is provided from a fund established by the late Mr. Eugen M. Schlesinger and Mrs. Schlesinger in memory of their daughter. It will be awarded by the Council, under the terms of the trust deed, to a suitably qualified person who will devote his or her whole time to "investigating the origin and nature of cysts of the brain whether arising from tumours or not or to such studies of other conditions of the central nervous system as the Council may from time to time permit." It will ordinarily be tenable at the National Hospital for Diseases of the Nervous System, Queen Square, London, and for a period of one year in the first instance. The stipend will be at the rate of £300 per annum, with up to £50 per annum for research expenses. Applications, stating age, qualifications, and research experience, together with the names of two referees, should be lodged with the Secretary, Medical Research Council, 38, Old Queen Street, Westminster, S.W.1, before April 21, 1939.

Reports of Societies

CORONARY THROMBOSIS

At the meeting of the Medical Society of London on March 13, with Dr. C. E. LAKIN in the chair, the subject for discussion was coronary thrombosis.

Dr. D. EVAN BEDFORD said that when coronary thrombosis was first recognized a distinction was drawn between it and angina pectoris, but a fuller understanding of the pathogenesis of anginal pain had only served to emphasize the unity of these two conditions. Anginal pain was an expression of cardiac ischaemia, and coronary thrombosis was generally the cause of such ischaemia. Between the mildest sternal oppression provoked by effort and the severest agony of coronary thrombosis every conceivable grade of painful attack might be found. All statistics showed that coronary thrombosis occurred far more often among men than among women, though after the age of 70 the sex incidence was more nearly equal. Was the condition becoming more frequent? It was certainly recognized more frequently, but the available evidence did not warrant the assumption that it had greatly increased during the last ten or twenty years. The stress and strain of life was readily blamed for its causation, but caution should be used in accepting such an explanation. Psychological stress had always been common, but it was more talked about to-day. After all, stress was what a man imposed on himself, not what the world imposed on him. It was popularly supposed that the incidence of coronary thrombosis was higher among brain workers, but post-mortem statistics were at variance on that point. The predisposition to coronary thrombosis was not a question of brain work or of manual work. In temperate zones coronary thrombosis was more frequent in winter than in summer months. The importance of heredity had been much exaggerated.

Some recent American statistics had suggested that in 40 per cent. of cases of coronary occlusion there was no pain, but he believed those statistics to be fallacious. Acute cardiac infarction due to thrombotic failure was almost always painful, but more gradual infarction from atheromatous closure of the vessel might sometimes lead to heart failure without pain. As for complications, embolism was likely to occur during the first ten days and might be pulmonary or systemic or both. He had seen it occur within twenty-four hours of the onset of pain. As to diagnosis, much had been made of coronary thrombosis simulating acute abdominal conditions, but genuine difficulty in diagnosis was now rare. He started treatment with $\frac{1}{4}$-grain doses of morphine. A low calorie diet was of real value. He now insisted on a completely fluid diet for at least a week. Digitalis was required for heart failure or auricular fibrillation, but in moderate doses. Rest could not be too complete or too prolonged. In acute cases he prescribed two months in bed as a minimum. Grafting operations such as Mr. O'Shaughnessy had carried out at Lambeth were on trial. They were founded on a good deal of fairly sound experimental proof, but when asked recently, "Should an operation be done?" he had replied, "Yes, but not on my patients," by which he meant that although the operation was soundly conceived it was very difficult indeed to make a decision as to which patients should be operated on.

Pathologist's Experience

Dr. KEITH SIMPSON spoke of the signs of coronary thrombosis which he had found in conducting 3,000 necropsies on cases in which death had taken place from the great variety of causes that ordinarily called for post-mortem examination. In this series there had been 330 cases of coronary thrombosis, 240 of coronary occlusion alone, and nine of coronary hypoplasia. The age incidence in the cases of coronary occlusion was about a decade later than in those of coronary thrombosis. Coronary thrombosis might occur as early as 30 with some frequency, whereas occlusion with atheroma alone was unlikely to occur before 50. The sex incidence was three males to one female; coronary thrombosis in the female before the age of 50 was quite uncommon. As to the site of the thrombosis, there was a striking preponderance of cases in which the left artery was involved. Not a few persons who developed coronary thrombosis and even infarction survived to an old age. In these 3,000 post-mortem examinations he had seen ninety-three old infarction scars. Nevertheless the immediate prognosis as evidenced by post-mortem figures was very grave. In nearly one-half of the 330 cases of coronary thrombosis death had taken place within forty-eight hours, and of these about one-third were cases in which the disease was recurrent—that is, there had previously been an attack. As a corollary to this rather grave aspect it was remarkable what exhausting occupations people with infarcts might follow. He related a case of a man aged 57 who dug over the clay soil of his garden for two hours, came in feeling rather tired, had a fairly large meal, dozed off, and an hour later was dead. Examination showed that there was an infarct some eight or ten days old. It was said that cardiac infarction might develop gradually without severe symptoms. His own experience was that such infarcts were found with considerable frequency and were more usually unaccompanied by a history of previous attacks. Each case demanded most careful examination and merited judgment on its own facts alone.

General Discussion

Dr. G. T. CALTHROP gave a demonstration of the value of the kymograph in the analysis of heart movements, and Dr. HOPE GOSSE showed a number of electrocardiographic tracings to illustrate the usefulness of electrocardiography in this field.

Dr. G. E. S. WARD asked how large a factor physical strain might be in bringing about the condition. He mentioned the case of a railway signalman who, during the severe weather at Christmas, had great difficulty in pulling the levers, the cold having contracted the wires to the signals, and he experienced a cramp-like pain in his chest on exertion. He was treated by his doctor for some days on the supposition that he had gastritis, because he had vomited, but later a straightforward attack of coronary thrombosis developed, with severe pain lasting twenty-one hours.

Dr. PARKES WEBER suggested that many cases of coronary thrombosis with death within twenty-four hours had been formerly attributed to poisoning. He mentioned one classical instance—that of the Emperor Claudius in A.D. 54, who was said by Tacitus to have been poisoned by his wife Agrippina. She failed fully to accomplish the deed, and called in the court physician Xenophon from the island of Cos to complete it by giving poison on a quill, Xenophon pretending to use the quill for the purpose of making him vomit. Dr. Parkes Weber considered this a most undeserved aspersion on a professional colleague, who was held in high esteem by the school of Hippocrates and even had coins bearing his portrait. His reading of the events was that Claudius died not from poisoning at all but from coronary thrombosis.

Dr. BERKELEY WAY said that practitioners who were over 40 years of age had not had the benefit of modern teaching on this subject and had not acquired what he called "coronary consciousness." For his own part, since his experience of a particular case, whenever he had a call at night to anybody who was said to be suffering from flatulent indigestion of any form, instead of merely prescribing bismuth and peppermint, he invariably went to see the patient, however inconvenient, in view of the possibility that it might be a coronary attack. Dr. ADOLF SCHOTT asked what was the best time to make an electrocardiographic tracing, supposing only one such record were made, in view of the frequency with which at the time of attack the curve was found to be normal or nearly normal, although within a few days it was absolutely typical. Dr. BEDFORD suggested that the fourth, fifth, or sixth day was the most likely time to yield the typical curve.

Dr. WILLIAM EVANS thought Dr. Bedford was a little severe in insisting on two months' rest in bed, though he would certainly have the patient in bed for six days. He did not think many patients in either private or hospital practice could be persuaded to carry out the sterner regime. He also commented on the different outcome observed in apparently the same type of case. He was asked by a general practitioner in a provincial town to see the mayor of that town, who had a recent history of anginal attacks and coronary infarction. He was prescribed six weeks in bed, failed to carry out the injunction, and died the very next day. But in the same town there was a butcher with exactly the same condition, the same history, the same electrocardiograph, who was also prescribed six weeks in bed, disregarded the prescription, and now whenever he was riding his bicycle delivering meat and met the doctor he made a scornful gesture in his direction!

Dr. ERIC GARDNER referred to the effect of cold weather in causing rupture, presumably owing to the rise of blood pressure. He had seven such cases of rupture of the heart, aorta, and cerebral vessels during the cold spell just before Christmas. He also recommended large doses of morphine irrespective of the age of the patient. He was called to one man, aged 90, who was in agony, and he gave him altogether as much as 1½ grains of morphine, which was followed by sleep and recovery. After his retirement from general practice another doctor had charge of him, and the man died in an attack. This doctor wrote that he gave him ¼ grain of morphine, but was afraid to give him more in case it should kill him. This speaker also mentioned an interesting case with medico-legal implications. This was the case of a motorist who, in collision with a lorry, was apparently instantly killed, the steering wheel having fractured his ribs and torn open his heart. On examination he was found to have very advanced calcification with thrombosis. The evidence of the lorry driver with whom he collided was that the man made no effort to avoid him, but that the car came slowly across the road, and the driver had his hands at his side and not at the wheel. It was evident that the man was dead before he hit the lorry, and shortly afterwards the speaker had a letter from a specialist, who said: "I understand you carried out a post-mortem on ——. For the last two years I had warned all members of his family never to allow him to drive a car. His coronary arteries were in such a state that I was absolutely certain he would die at the wheel."

Dr. BEDFORD, in the course of his reply, said that it was admitted that patients with coronary thrombosis could ride bicycles and engage in a good deal of strenuous exertion, but the physician who advised them to do so was culpable. The duty of the physician was to advise what he thought was safe, not to suggest how much they could do and get away with it. Dr. KEITH SIMPSON said that as to the age at which coronary thrombosis might occur he had in the series he had mentioned six cases between the ages of 29 and 35, but he had not had a case in a woman aged below 40. He hoped that in future the medico-legal aspects of these cases, and in particular the forensic pathologist's experience of them, would be placed side by side with the aspects interesting the clinicians and cardiologists.

RESEARCH ON VITAMIN E

At a meeting of the Section of Therapeutics and Pharmacology of the Royal Society of Medicine on March 14, with Dr. J. W. TREVAN in the chair, a discussion took place on recent research on vitamin E, and in particular on its possible value in treating cases of habitual abortion.

Professor J. C. DRUMMOND began by remarking that during the last year the chemical structure of the vitamin had been made known. The position on the chemical side had been clarified considerably. Recently this group of vitamins—for there were three very closely related compounds in the vitamin E group—had been isolated and their constitution determined, and with the synthesis of one at least of them carried through, the work on the chemical side might be regarded as almost complete. He went on to give a brief review of recent developments in the study of the physiological function of vitamin E. A considerable amount of information was now available pointing to a relationship between this vitamin and the function of the anterior pituitary. It did not appear that vitamin E exerted any direct gonadotropic effect, but it was evident that in vitamin E deficiency the anterior pituitary, particularly in the case of male animals, had an appreciably increased gonadotropic action.

The general picture of vitamin E deficiency, said Professor Drummond, suggested a hormone imbalance. Some had said that it pointed to a dominant action of an oestrin-like factor. Such a hypothesis would be in keeping with some of the facts, but it was not supported by other observations. In particular the testicular degeneration characteristic of vitamin E deficiency differed significantly from that which was produced by injections of oestrone. The degeneration of the testicle was extraordinarily severe and complete, and attention had been drawn to the great difficulty of regenerating the testes. Even when the degeneration was not complete a very large amount of vitamin E feeding was necessary before any regeneration took place, and if the degeneration was at all marked to start with no amount of prolonged feeding would put it right. So far no success had been obtained in any attempt to prevent typical castration resorption in does, or to cure the typical degeneration of spermatogenic tissue in males by the administration of pituitary extracts or hormone preparations, administered with a view to restoring a more normal balance of influence. The present position on the biological side ruled out any simple hypothesis regarding pituitary hormones, but the investigation was being carried forward in several quarters.

Difficulties of Assay

Mr. A. L. BACHARACH said that advances in vitamin E therapy were handicapped, first, by the absence until quite recently of pure preparations of vitamin E, and, secondly, by the difficulties of estimating the amount of vitamin E in natural sources and concentrates prepared therefrom. There was a further complication in that the rat was the experimental animal used almost exclusively in this work, but its ovarian cycle differed in many important respects from that of the human. This made it difficult to apply results obtained from the one to the treatment of conditions in the other. Nevertheless, the brilliant intuition of Vögt-Moller had led to practical proposals which were gradually bearing fruit. The use of the rat for the assay of vitamin E brought in more than the usual large errors of biological tests, because of the nature of the response to treatment. Recently devised physical and physico-chemical tests, however, appeared to be of value, and should help in providing a standardized source of vitamin E for therapeutic and veterinary use. Experiments with animals, although primarily conducted for purposes of qualitative and quantitative biological determinations, had led to considerable knowledge about the effects of vitamin E deficiency in the rat. He mentioned the muscular dystrophy described by a number of workers, the effects on the various endocrine organs, the marked uterine discoloration, the increased requirements for vitamin E after a first resorption, and the increased difficulty of securing implantation of the fertilized ovum after a first resorption. All these phenomena might supply some of the essential data for constructing a coherent picture of the relationship between vitamin E and the whole of the endocrine mechanism connected with the reproductive organs. With the availability of pure tocopherol and of chemical tests for its estimation rapid progress should now be made in this field.

Miss M. O. BARRIE described some experiments on the rat showing toxaemia of pregnancy produced by slight deficiency of vitamin E, abnormalities of the young caused by the lack of the vitamin in the mother's milk, and the prolongation of gestation in many such partially deficient rats. She also described the pigmentation of the rat uterus in severe vitamin E deficiency.

Questionable Clinical Value

Professor F. J. BROWNE discussed the use of vitamin E preparations in cases of human abortion. He mentioned the reports of a number of observers which suggested that the use of wheat-germ oil in habitual abortion was followed by success in about 75 to 80 per cent. of cases. At first sight this appeared convincing. It was, however, disconcerting to find that equally good or better results had been obtained by the use of other methods of treatment. Thus it was well known that good results followed the use of progestin. He had collected from reports in the literature eighty-nine cases treated by that substance, with 86 per cent. of successes. He was aware that there might be some connexion between vitamin E deficiency and insufficiency of the corpus luteum, for it had been shown that the anterior pituitary gland of rats fed on a diet deficient in vitamin E contained less prolan A and B than normal, and this might conceivably explain comparable results on administering vitamin E and progestin in cases of habitual abortion. From the literature it seemed that a moderate and fairly uniform degree of success followed the use of a large variety of therapeutic measures in idiopathic habitual abortion, and it was not surprising if doubts were beginning to arise in the minds of some regarding the real value of any of them. No one seemed to have taken the trouble to find out what proportion of patients who had had two or more spontaneous abortions might be expected to go to term without any treatment or only general directions regarding rest at the time of the period and avoidance of marital relations, and yet the records of many hospitals must contain sufficient material for such a calculation. The question could be settled definitely if alternate cases were treated as controls, and this had been done during the last year or two at University College Hospital. Eighteen cases of habitual abortion had been treated, all of them being patients who had had at least two, and most of them three, spontaneous abortions, and none having had a living child. Of the eighteen cases eight were treated by progestin and three by vitamin E; all were successful. Seven patients were controls and received no special treatment; of these seven, two were hospitalized and five treated as out-patients. The seven controls were equally successful, and all the women, treated and untreated, gave birth to living children at term. In conclusion he quoted Wilbur: "The necessity of vitamin E for normal embryonic growth in animals other than the rat and mouse has not been established. . . . It is difficult to obtain proof that vitamin E is of value in the treatment of . . . habitual abortion in human beings." With this statement he saw no reason to disagree.

Professor DRUMMOND pointed out that the diets of the poorer section of the community were deficient in vitamin E. The only really important natural sources of the vitamin were wheat germ, which was practically not eaten by the poorer people, and green vegetables, which again entered only to a small extent into such dietaries. There was thus a good case for believing in a deficiency in vitamin E.

Professor BROWNE said that he was sorry if he had dropped a bombshell, but he merely wanted a more critical attitude towards the results. Clinicians should be wary of taking a small series of cases of abortion treated by vitamin E and claiming successes. *Post hoc* was not always *propter hoc*.

ESCAPE INTO PSYCHOSIS

At a meeting of the Medical Society of Individual Psychology, held on March 9, with Dr. H. C. SQUIRES in the chair, a paper entitled "The Escape into Psychosis" was read by Dr. R. D. GILLESPIE, who said that the motive of mental illness as a flight or escape had been a popular one which had captured the imagination. It was simple; and sometimes it was a fairly accurate conception. In so far as it fitted in with the more general conception of mental illness as a failure of adaptation it was scientific; but in so far as it carried the implication of something purposive and deliberate it was much less obviously so. A purpose had to be the purpose of something. Purpose was easier to understand as a function of the ego; but in many instances of psychosis it was emphatically not the ego which was responsible for the manœuvre. In fact the impression which one obtained from the psychotic mental content was more often that of the ego being overwhelmed by something foreign to it than of the ego's willing participation in an "escape" from anything. In such cases the ego looks on helplessly; if escape were possible it would be from the surging inner pressure of emotions and desires; but the latter will out, and reality is not so much escaped from as supplanted. There were in fact two kinds of reality—one outer and one inner, one public and one private. The ego has been well said to face two ways: outwards to the external world, and inwards towards the innate impulses and desires, some of them acknowledged, some of them not. Mental escape had to be considered, therefore, from the following aspects: (1) as an escape from external reality; (2) as an escape from inner reality. Possibly only the first of these might rightly be called psychotic.

Dr. Gillespie illustrated the concept of psychosis and escape with a variety of instances embodying all the principal types of mental illness.

Local News

FRANCE

[FROM OUR CORRESPONDENT IN PARIS]

Jubilee of the Pasteur Institute

On Wednesday, March 15, the fifty-year jubilee of the Pasteur Institute in Paris was celebrated in the presence of the President of the French Republic and the world of science, represented not only by the most distinguished leaders of the medical profession in France, but also by many scientists from other countries. It will be remembered that the French Academy of Sciences took the initiative more than fifty years ago in opening a national subscription for the erection of an institute in which Pasteur could work and inspire his many followers. On November 14, 1888, the new institute was inaugurated by the President of the Republic, Sadi Carnot. On Pasteur's death in 1895 Duclaux, the father of biological chemistry, took charge of the Pasteur Institute with Roux. Only a few years later Duclaux inaugurated the new chemical laboratories in the grounds of the Pasteur Institute. A little later a hospital for infectious diseases was erected within the precincts of the Pasteur Institute. Meanwhile, only a few miles away, the annex at Garches, at first little more than stables for horses yielding diphtheria antitoxin, was coming into prominence chiefly on account of Ramon and his work on diphtheria anatoxin. Last, but by no means least, come the tuberculosis laboratories established in the Pasteur Institute under the inspiration of Calmette and in large part devoted to B.C.G. research and preparation. The memorial ceremony held on March 15 was presided over by M. Marc Rucart, the Minister of Public Health, who spoke of the Pasteur Institute as a body fighting for the widening of the frontiers of life. After this address, which had been preceded by short speeches from several other leaders in the scientific world, M. Lebrun proceeded to the tombs of Pasteur and Roux, also within the grounds of the Pasteur Institute, and to an inspection of the rooms which Pasteur occupied within the Institute and which, without any change, now serve as a shrine and a museum.

Professor Leriche and the Collège de France

Only about a couple of years ago the title of René Leriche to that of the greatest living French surgeon was endorsed by his election to the chair of medicine of the Collège de France, founded as long ago as 1529 by François I. Since then the occupants of this chair have included some of the most distinguished names in the history of medicine—Laënnec, Claude Bernard, d'Arsonval, Charles Nicolle, to mention only a few. Leriche came to Paris to lecture but not to live: naturally, for he had made Strasbourg a surgical Mecca to which medical and surgical pilgrims flocked from the ends of the earth. Had hospital facilities worthy of such a pioneer been provided in Paris he might possibly have been tempted away from his old love. Or he might have been willing to continue his lectures in Paris and his practical work in Strasbourg, the one supplementing rather than supplanting the other, had all concerned appreciated fully the importance of his contributions in both cities. The upshot of the conflict of claims on Leriche has been his abandonment this year of his now famous Collège de France lectures. A great pity.

In Defence of Compulsory Diphtheria Immunization

The meeting recently convoked at the Pasteur Institute by the Société de Médecine Publique on the subject of immunization against diphtheria was addressed by a succession of distinguished medical speakers, among whom was Surgeon General Dopter, who traced the behaviour of diphtheria in the French Army since the beginning of 1930. At this stage diphtheria in several regiments in France and Algeria was proving refractory to prophylactic measures hitherto in fashion—the tracking down of definite and abortive cases, the isolation of the sick, the search after and isolation of carriers, disinfection, and so on. It was then that Surgeon General Dopter took the initiative in combining typhoid immunization with diphtheria immunization according to the associated method of Ramon and Zoeller. At first only the Schick-positive recruits were thus treated, three injections being given at intervals of twenty-one and fifteen days respectively. Older soldiers served as controls, and the comparison between the two groups was so strikingly in favour of diphtheria immunization that in December, 1931, it was made compulsory in the Army under certain well-defined conditions. As the diphtheria morbidity declined these conditions were modified so as to favour the more general application of this measure, and in August, 1936, immunization became obligatory for the whole Army and without a preliminary Schick test being required. Among the 163,000 soldiers thus immunized between the beginning of 1930 and October, 1936, the diphtheria rate was only 0.82 per 1,000, whereas the corresponding figure was 9.65 for the 112,000 soldiers who were not immunized. Surgeon General Dopter also said that while the diphtheria morbidity in the Army of the East in 1933 was 10.1 per 1,000, it was only 0.6 in 1937.

ENGLAND AND WALES

Hospital Developments at Leeds

At the annual general meeting of the governors of the General Infirmary at Leeds details of a three-years plan of development were outlined. The chairman of the board of management said that plans for the extra accommodation of staff had been prepared and two new theatres had been built and equipped. The cost of these developments would be about £30,000. During 1938 new departments had been opened and equipped and theatres and sterilization plant had been reconditioned, with the result that the year had seen the highest expenditure in the history of the infirmary. The annual report recorded that much progress had taken place in schemes made possible by the completion of the special appeal for £250,000. Building of the new out-patients' department and the pay-bed block was progressing—the latter was expected to be in commission by the end of the year—and the new *x*-ray department was also nearing completion. The necessary equipment would cost nearly £10,000. The whole of the electrical installation was to be renewed at a cost of £1,000, and twin theatres for the pay-bed block were to be built at a cost of about £7,000.

Presentation to a Northumbrian Doctor

A presentation of an illuminated address, a book containing the names of the several hundred subscribers, and a cheque for £112 was made recently to Dr. R. A. Welsh at Felton, Northumberland, on his retirement after forty-seven years' practice in that district. The presentation was made at a meeting in the village hall, which was crowded out with old patients, neighbours, and medical colleagues, some of them having come from a considerable distance. Mention was made of the fact that Dr. Welsh came to Felton in the 'nineties, where he succeeded to the practice of Dr. Hedley, whose daughter he married, and that he was now being succeeded by his son; for five generations this country practice has remained in a family, and the house in which Dr. Welsh has lived has been a doctor's house for two hundred years. Many tributes were paid in the course of the meeting to this representative of the best type of country practitioner, and the address read:

". . . During forty-seven years amongst us you have shown the utmost tactfulness, skill, and concern for all who have been in need of your ministrations. This testimonial is a symbol of your unselfish and devoted work amongst us, and we pray that your honourably earned retirement may be blessed with long life and happiness." In thanking his friends, of whom he said he never knew he had so many, Dr. Welsh remarked that it was incomprehensible to him that he should be rewarded for having spent a happy life amongst them as a doctor for nearly half a century. He accepted the gifts not merely as a recognition of any services of his own but as a compliment and tribute to the medical profession. As a family doctor he had always tried also to be a family friend to his patients, and looking at the kindly faces before him he felt he must have succeeded. Dr. Welsh, who joined the British Medical Association as far back as 1893, has represented his Division at most of the Annual Representative Meetings since 1920. He has also been a well-known figure at the Panel Conferences, and served for several years on the Rural Practitioners Subcommittee of the Insurance Acts Committee. In his retirement he has gone to live at Gosforth, near Newcastle, where the good wishes of his many friends in the Association will follow him.

Correspondence

Stilboestrol

SIR,—The relative inexpensiveness of the new synthetic oestrogen stilboestrol, together with the commercial publicity which has hailed its advent, will undoubtedly result in its employment by many doctors hitherto inexperienced in oestrin therapy. Stilboestrol has been stated to be approximately two and a half times as active as a similar weight of oestrone. My clinical experience is in agreement with such an estimate. In spite of this the commercial literature recommends the daily oral administration of between 0.5 and 2 mg. for the treatment of climacteric disturbances, a dose which would be roughly equivalent to 1.25 to 5 mg. of oestrone by mouth (12,500 to 50,000 international units).

Now, in spite of a minority opinion to the contrary, there can be little doubt that the prolonged administration of oestrogens may in time exert an inhibitory effect upon the adenohypophysis. This effect is seldom noticed in the so-called "pyknic" constitution—that is to say, in the sthenic, extroverted individual who has always enjoyed robust health and physical vigour and whose weight and blood pressure tend to rise at the climacteric. Such individuals would appear to be capable of tolerating relatively large amounts of oestrogens over indefinite periods with benefit. But with the leptosome or subpituitary type of individual it is a very different story. The clinical recognition of such types in the fifth decade is often a matter of difficulty, since not all of them exhibit the characteristic expression or the infantile or eunuchoid proportions, particularly when the latter have been masked by the effects of repeated pregnancies. One has often to be guided by their past health—a history of "anaemia," lethargy, or nervous breakdowns in earlier life; the late onset of the catamenia or other menstrual indications, such as epimenorrhoea; the presence of visceroptosis; sensitivity to the cold or circulatory disturbances. At times it is the physique of the daughters that may first suggest the maternal constitution. To such individuals, according to their degree, the climacteric is either just another setback in a train of ill-health or the incident which finally exposes their basic physical weakness. It would almost seem that the withdrawal of the little ovarian activity that may have existed is followed by an involution rather than a hyperplasia of the pituitary basophil cells. In the severer forms of this leptosome or subpituitary state oestrin treatment is of little or no value, but in all such types it must be employed with the greatest caution for fear of producing effects which are compatible with pituitary inhibition. In the past few months I have seen a number of cases, two of them my own, where such effects have undoubtedly been produced by the daily oral administration of 1 mg. of stilboestrol. The symptoms so occasioned may vary from an accentuation of physical lethargy, with backache, headache, and vomiting, to a profound degree of nervous and physical prostration, sometimes associated with cachexia and melancholic tendencies. Such symptoms are not specific for stilboestrol, for in the past I have observed their occurrence following the administration of both testosterone and oestrone. In the elderly and senile they have been produced by doses of oestrone as small as 0.3 mg. daily by mouth. These effects, if recognized early, will usually disappear in three or four weeks after treatment is discontinued.

In the past the relatively high cost of these preparations was to some extent a safeguard against overdosage. Such a safeguard now no longer exists. The more that one sees of the climacteric the more one appreciates the complexity of the problems involved and the difficulties that beset its treatment. Certainly with oestrogenic substances it is true to say that familiarity breeds respect. There can be little doubt that stilboestrol possesses great possibilities. In the interests of patients, doctors, and manufacturers, however, I would counsel caution in its employment until more clinical information becomes available.—I am, etc.,

Manchester, March 13. H. R. DONALD.

Hormones for Undescended Testis

SIR,—Dr. G. R. Peberdy's letter in the *Journal* of March 18 (p. 588) illustrates the lack of concern with which many regard something that would worry me considerably—namely, redness, swelling, and pain in the testis after hormone treatment for "maldescent." We have very little knowledge, for obvious reasons, of what the effects of this treatment are on the testis of man. But consider what they are on the testis of the rat, the experimental animal on which most of this work is founded.

1. There is a hypertrophy of the interstitial tissue, with consequent increase in weight.

2. There is an accompanying degeneration of the spermatogenic cells, possibly due to pressure from the interstitial hypertrophy. I should be inclined to put down the pain and swelling in the human to a process not very unlike orchitic mumps.

3. There is an interference with fertility; the animals which have been treated do not mate.[1]

4. If treatment is continued there is an atrophy of the testis as a whole, which ends up smaller than that of untreated controls. I have seen several human testes in which I strongly suspect that this process has occurred.

Then consider two points touching the human experimental animal:

1. The percentage of descents after hormone treatment is the same as the percentage of spontaneous descents. In other words, all that can be gained is an acceleration of a normal process.

[1] Engle, E. T. *Sex and the Internal Secretions*. Edited by Edgar Allen, London, 1932.

2. The testes that advocates of hormone treatment describe as being in the inguinal canal before treatment are really in the subcutaneous tissues, between the muscles and the fascia of Scarpa, in a space I have called the "superficial inguinal pouch."[2] I have said for several years that a testis which is in the inguinal canal cannot be felt. This statement has produced many explosions, and a fair number of subsequent agreements; but it has never been refuted on the human body.

To sum up, I submit that the hormone treatment of undescended testis is dangerous, useless, and founded on an anatomical error.—I am, etc.,

London, W.1, March 21. DENIS BROWNE.

Acute Dilatation of the Stomach

SIR,—Although Mr. Hamilton Bailey, in his article in your issue of March 4 (p. 434), states that "acute dilatation of the stomach is encountered after such divergent surgical procedures that nothing profitable is likely to accrue from enumerating them," it is possible that an account of personal cases might prove of interest and stimulate discussion with a view to elucidating its aetiology.

Case 1.—A man aged 35 was operated on for perforation of a peptic ulcer in 1932. Pain recurred nine months later and continued intermittently until 1936, when it became associated with vomiting and loss of weight. A barium meal showed enormous dilatation of the stomach due to pyloric stenosis. Gastric lavage was carried out daily for ten days, and operation was performed on December 16, 1936, under gas, oxygen, and ether. The pylorus was puckered and contracted and the stomach wall hypertrophied. The appendix was removed and a posterior gastro-jejunostomy performed. The following day he was very collapsed and the pulse had risen to 148. He looked extremely ill, but there had been no vomiting. Through a Ryle's tube two pints of frothy peat-like fluid were evacuated and continuous intravenous saline commenced. The stomach was aspirated half-hourly. Improvement was immediate, and by the evening of the fourth day after operation the pulse was normal.

Case 2.—A man aged 55 was admitted to hospital from a train accident. He was very shocked. Temperature 96° F., pulse 120. A radiograph showed fractures of the horizontal and descending rami of the pubes on both sides, also fractures of the ninth, tenth, eleventh, and twelfth left ribs. There was no evidence of injury to the pelvic viscera. A severe lacerated wound was present involving the muscles of the left thigh. This was operated upon the same evening under gas and oxygen. On return to the ward his general condition was fairly good (temperature 100.4° F.; pulse 126). I was asked to see him the following day at 4 p.m. as his general condition had now deteriorated and the pulse was rising steadily. There had been no vomiting. Internal haemorrhage was suspected, but although the abdomen was greatly distended there was no tenderness or free fluid. A catheter specimen of urine showed no blood. A Ryle's tube was passed and a large quantity of the typical fluid evacuated, and aspiration was continued at half-hourly intervals. Continuous intravenous saline was commenced, and coramine injections given at four-hourly intervals. Improvement was rapid. The following day the pulse had dropped to 124 and the patient passed urine in the evening for the first time. On the second day the pulse was 110, and by the fifth day it had fallen to 92. He eventually made a good recovery and was discharged nine weeks after admission.

Mr. Hamilton Bailey rightly stresses the fact that vomiting occurs relatively late. The diagnosis should be made before it occurs. In the absence of haemorrhage a rising pulse rate after injury or operation indicates acute dilatation of the stomach until excluded by gastric aspiration.—I am, etc.,

London, W.1, March 12. CAMERON MACLEOD, F.R.C.S.

[2] Browne, Denis. *British Medical Journal*, 1938, **2**, 168.

Direct Inguinal Hernia

SIR,—Mr. W. G. Gill (*Journal*, February 11, p. 263) has drawn our attention to an interesting and rare variety of direct inguinal hernia. I operated upon fifty-five cases of inguinal hernia last year, but I am not aware of having come across one of these until last week.

The patient was a bus conductor aged 46, who had noticed an easily reducible swelling in his right groin for five years. He affirmed that there was no swelling before then, and thought it might have been caused by a strain while helping the driver crank up the bus; clinically it was diagnosed as a direct inguinal hernia. At operation a small sac of peritoneum was found protruding through a very definite round hole in the fascia transversalis of the posterior wall of the inguinal canal, medial to the deep epigastric vessels. The condition was exactly similar to that shown in Mr. Gill's diagram. The diameter of the opening was half an inch, and its edges were tough fibrous tissue of condensed fascia transversalis. I repaired the weakness with fascia lata. A strip was taken from the thigh by means of a fasciotome and split into three lengths. One was used to close the hole in the fascia transversalis; the other two were used to reinforce the inguinal canal by Gallie's method.

It seems to me that this method of repair by using fascial strips gives a sounder reinforcement to the very definite gap than can either catgut or silk. An alternative method would be Mr. Philip Turner's operation in which a flap of fascia lata is turned up beneath the inguinal ligament and used to patch the deficiency in the fascia transversalis.—I am, etc.,

Lewisham Hospital, March 13. G. C. DORLING, F.R.C.S.

Placenta Praevia

SIR,—In the *Journal* of March 18 (p. 586) Dr. Terence Robinson writes: "Dr. Bethel Solomons is reported to have suggested that when Caesarean section was employed the classical operation was the procedure of choice." I did not suggest. I stated definitely that from my experience I had become converted from the lower segment to the classical operation in cases of placenta praevia. The low implantation of the placenta makes the lower segment operation more difficult without achieving better results. There was no mortality from either variety of section for placenta praevia during my Mastership of the Rotunda.—I am, etc.,

Dublin, March 20. BETHEL SOLOMONS.

A Complication of Haemostasis

SIR,—The use of preparations which, following hypodermic injection, check or stop haemorrhage is increasing with their growing effectiveness. I have on several occasions used an injection of stryphnon (Homburg Pharma) with the most satisfactory results. Ten days ago I saw a patient who had in a few hours lost a great deal of blood following an abortion; she was still bleeding and in no condition for operation, and so after packing her vagina and administering an intravenous saline I gave her an injection of stryphnon. The haemorrhage seemed to stop, but the following day I decided to give her a transfusion. I summoned a donor (both were Group O), but on cross-matching found that her serum rapidly agglutinated his corpuscles; it did the same to mine (tested and shown to be Group O three times during the last ten years), to those of a colleague (grouped then and there and found to be Group O), and to those of another colleague (not grouped). So we called off the transfusion. Incidentally, I re-grouped the original donor then and there, and found him still Group O.

As we were controlling by standard sera these agglutinations could not possibly be due to an error in technique. The matter is obviously one of great importance, and it would be interesting to know whether others have had a similar experience. Obviously if stryphnon and kindred substances are going to make a subsequent transfusion a very risky proceeding they will have to be used with the greatest caution if a transfusion is likely to be called for; and this, in general practice, usually means in cases of sudden haemorrhage of uterine origin, the treatment of which in the country is difficult enough as it is. The increasing use of blood transfusions is all to the good, and styphnon is, I find, a very present help in the treatment of haemorrhage, so I am loath to condemn the latter without giving others a chance of voicing their experiences.—I am, etc.,

GORDON SCOTT, M.B., M.M.S.A.,
Burford Hospital Blood Transfusion Service.
Shipton-under-Wychwood, March 19.

Copper and Cobalt in Anaemia

SIR,—I have read Dr. C. R. Baxter's letter in the *Journal* of March 11 (p. 534) with very great interest. The work on the experimental production of polycythaemia by the administration of cobalt, as also the later work of Filmer and Underwood on "bush sickness," prompted me to investigate its therapeutic application. Some six months ago I treated two cases with cobalt (using cobalt chloride). The first was a child, aged 3, with acute lymphatic leukaemia, to whom I gave 10 mg. of cobalt three times a day for five days; the second was a young woman, aged 23, with hypochromic anaemia, to whom the same dose was given for ten days. In neither case did I obtain any evidence of reticulocytosis, and to that extent my findings fit in with those of Dr. Baxter. However, I feel his series is too small to conclude that cobalt is, and can be, of no value in hypochromic anaemias.

There are certain references to its therapeutic use in the literature. Joó (*Orv. Hetil.*, 1932, **76**, 146) administered cobalt (in the form of smaltine) in three doses of 20 mg. to some twenty-two patients in an institution. He found that in most cases there was an increase in both the total red cell count and the haemoglobin, the increase in the former being greater than in the latter. Waltner (*Acta Paediat.*, 1930, **11**, 438) gave cobalt to a series of children suffering from anaemia, and found an increase in the total red cell count. Although I admit that the absence of effective controls vitiates to a certain extent the value of the results obtained, such observations would appear to indicate the necessity for further work on the subject to determine under what circumstances, in the human subject, the administration of cobalt may be of value.

Barron and Barron (*J. exp. Biol. Med.*, 1936, **35**, 407) found that the simultaneous administration of massive doses of ascorbic acid inhibited the polycythaemia of rabbits caused by the injection of cobalt. Whether a high intake of ascorbic acid may affect the course of polycythaemia vera in man is a point that may well be worthy of investigation.—I am, etc.,

London, W.C.1, March 14. E. CRONIN.

Haematuria following M & B 693

SIR,—Ever since the discovery of M & B 693 it has been extensively used for a variety of conditions. By this time there should be no doubt about its efficacy in pneumonia and pneumococcal conditions. Quite a number of toxic reactions to the drug, such as headache, vomiting, breathlessness, dizziness, lassitude, general malaise, rash, cyanosis, methaemoglobinaemia, have been noted, but on the whole it has come to be regarded as safer and less toxic than prontosil and allied compounds. Recently, however, I have come across a complication about which I have so far not read. It is the onset of haematuria following the administration of the drug for three days.

Mr. A. was taken ill on March 4. He had lobar pneumonia, with a high temperature, cough, severe pain on the affected side, a disturbed pulse–respiration ratio, diminished air entry, and signs of congestion. He was put on M & B 693, two tablets every fourth hour, ten being the total administered that day. Next day he was much better and his temperature was not so high. He was given eight tablets. On the third day his temperature came down to normal and he looked immensely improved. The dose was then reduced to six tablets. On the fourth day, however, I was called to see the patient as he had started passing blood in the urine that morning. The administration of M & B 693 was stopped, and he was put on an alkaline mixture. The urine cleared within twenty-four hours. Examination of the urine showed albumin in moderate quantity and a large number of red cells. No calculi, casts, or ova were detected.

Since the patient had no previous history of haematuria, and the condition developed for the first time on the administration of M & B 693 and ceased with its cessation, it is safe to attribute this complication to the drug. It should be stated that only sodium bicarbonate and glucose were given at the same time; no sulphates in any form were administered.—I am, etc.,

Nairobi, March 13. K. V. ADALJA.

Treatment of Pneumonia with M & B 693

SIR,—In your issue of March 11 (p. 506) you published some notes by Dr. H. G. Langdale-Smith on the drug known as M & B 693. Lest his readers should be led to be unnecessarily pusillanimous, I would like to make the following points. First, Dr. Langdale-Smith states no dose, simply saying "M & B 693 was given," and later he indicates that he gave no initial heavy dose. From my limited experience it has seemed that it is of the greatest importance to saturate the patient thoroughly and to keep him saturated. This leads me to my second point. Dr. Langdale-Smith states that he omits the doses due at night. Since it has been shown that the greater proportion of the drug is excreted within twelve hours, is this not likely to allow the pneumococci undue scope during the night? Thirdly, Dr. Langdale-Smith suggests that it is unwise to risk toxic effects, in view of his relative success with (presumably) small doses without any initial saturating dose. I am unable to find any literature describing serious toxic effects for which the drug could reasonably be blamed when it has been given in large but reasonable doses, such as those given below. I feel that the slight anaemia and the blueness resulting, in a few cases, from full doses are less dangerous than the relapses he describes. The dosage I have used (and, I believe, that suggested by the makers) is as follows:

For adults: 1 gramme per stone weight, with a maximum of 8 grammes in the first twenty-four hours—for example, four tablets repeated in four hours, and followed by two tablets four-hourly until the temperature has been normal for twenty-four to thirty-six hours.

For children: 2 grammes per stone weight—for example, for a child of 3 st. in weight, three tablets, followed by three tablets, then one and a half tablets, four-hourly.

For infants: 3 grammes per stone are required in most cases, and are well tolerated—for example, for an infant weighing 16 lb., two doses of one and a half tablets, followed

by four doses of three-quarters of a tablet, all at four-hourly intervals.

In all these cases the maintenance dose is continued until the temperature has been normal for at least twenty-four, and preferably thirty-six, hours; half the dose is given four-hourly for a further similar period.

These dosage schemes have served me very well. The only complications I have encountered are: (i) the mild anaemia mentioned above, which reacts well to iron, and so far as I know never becomes alarming except in cases in which the patient is allowed to become moribund before the drug is employed; (ii) there is, I believe, a slightly higher rate of incidence of pleural effusions in cases of lobar pneumonia in which M & B 693 is used, but these effusions are far more often sterile and very soon resolve spontaneously; (iii) a gastric toxic effect, with nausea and vomiting, is not uncommon, and in most cases can be overcome by giving half-doses at two-hourly intervals, the tablets being pounded up in citrated milk; (iv) a transient and, so far as I know, harmless cyanosis; and (v) a transient and insignificant rise of temperature on discontinuing the drug. Let us not, therefore, be cowardly in our prescribing.—I am, etc.,

Royal Surrey County Hospital, Guildford, March 14. R. A. SHAWYER.

Coal-gas Poisoning and its Prevention

SIR,—With reference to the letter from Dr. E. B. Hazleton in your issue of March 18 (p. 585), inasmuch as a very common cause of carbon monoxide poisoning is suicide in intent and the gas is derived from the main two points occur to me: (1) It is unavoidable that gas from the mains should contain a high percentage of carbon monoxide, because that is what gas is there for —that is, for its heating rather than its illuminating content. (2) I understand that this high CO content is derived from admixture with "water gas" and that it costs less to make gas this way than simply from the distillation of coal. To eliminate CO from domestic gas would therefore appear to be unsound from the economic and domestic points of view.

Some years ago in a discussion on suicide at the Medico-Legal Society I suggested that it would not be beyond the skill of chemists to make gas from the main irrespirable by including a small proportion of a physiologically irritant gas. May I repeat this suggestion? I am informed by my chemical friends that there are several substances of this type which would not foul the conducting pipes.—I am, etc.,

London, W.C.1, March 17. A. KNYVETT GORDON.

Shock Therapy

SIR,—It would appear to me that Dr. Ian Skottowe (March 11, p. 534) completely misunderstood my letter for the reason, probably, that he has not read anything I have published or written on the subject.

If one studies the physiological action of histamine and the research work which has been done in connexion with that substance, one would notice at once that all Dr. Skottowe claims as happening, in his letter, can be done by histamine, and therefore I have only put a name to the substance he is writing about. It will be seen, therefore, that in reality he entirely agrees with me, though not aware of it. There is one other point, however: Dr. Skottowe writes, "I have, however, yet to see a case of schizophrenia which has been cured by intestinal obstruction." I have never even suggested such an impossibility in anything I have written. The combination of histamine and insulin is given in carefully graduated doses, which have to be adjusted to the patient, for six weeks or so at a time, and the improvement in the patient takes place gradually and slowly.—I am, etc.,

HORACE HILL, M.R.C.P.
Medical Superintendent.
Laverstock House, Salisbury, March 11.

Three-phase Modified Bendien Reaction

SIR,—Reliable confirmatory evidence of experimental work such as is contained in Dr. C. H. G. Price's article on the three-phase Bendien reaction in the *Journal* of March 18 (p. 551) is always of much scientific interest and importance. The impression that this report conveys is, however, that the scientific knowledge and value of these reactions have not advanced since the earlier publications of 1933, whereas such an implication is far from being the actual case. The fact that it may be construed by readers of the *Journal* in this light prompts me to remark upon several points of importance. While these columns are unsuitable to discuss at any length the intricate technicalities of colloidal chemistry it is essential to emphasize the advances on the positive side that research work has accomplished during the last six years, and particularly from the clinical aspect. Dr. Price has reported confirmatory negative evidence of work done several years ago, while in the meantime a great deal of knowledge has accrued from the scientific aspect of the mechanism of the reactions as well as knowledge from the clinical point of view of those physiological and pathological conditions that lead to alterations in the test results.

Two years ago I wrote in relation to this test that "it is essential to study these reactions in the light of the physico-chemical factors involved in order to gauge and interpret the results in the most relevant way. With this knowledge one can then apply such tests rationally and report their results on a basis of known facts, instead of merely making a repetition of mechanical readings as a result of a technical manipulation." It is therefore illogical to state, as in this article, that "the basic processes of the test do not serve as an index of any particular property of the blood serum or serve to measure any specific constituent." Action and reaction are always equal and opposite, so that surely, therefore, it would be more accurate to state that the nature and mechanism of the reaction are not elucidated by the experiments quoted. Especially so when such an elucidation can readily be effected on the basis of colloidal physics, and an effective conception of the mechanism of the reaction can be fully realized together with the changes brought about by heat inactivation and ether extraction. This has all been fully published and needs no further comment.

The important fact to realize is that with the understanding of the rationale of the test the reactions may be applied scientifically to a positive and practical clinical use. On such a basis has grown our knowledge of the relationship of Phase B to infective states and the important changes brought about in this factor as a result of exposure to *x*-radiation and radium. Although I am in complete agreement with Dr. Price's views about the prognostic value of the test in cancer, it would have proved interesting to know the relationship of treatment by radiological methods in his series to the time that the blood was tested. A chronic osteo-arthritis of the hip or an allergic asthma will always give a "malignant" result, while an infective arthritis will always give a "negative or non-malignant" result. Nevertheless the latter may rapidly turn into a typical "malignant" picture after a

dose of gold. It is relevant also to shatter the conception that there is some magic property in the chemical vanadium. It acts in this test simply as a negatively charged colloid, and, furthermore, with any other polymerizing or polyacid, such as tungstic acid or phosphomolybdic acid, exactly the same test reactions may be obtained.

Finally, I am in complete agreement that to make an estimation of the result of a "single tube of initial flocculation" tells but a minor part of the story, and I am convinced that a greater value may be obtained by plotting on a chart the curves of all three phases. More than 3,000 sera have been examined in this way and charted. I have termed the reaction "the differential sedimentation test," if for no other reason than to divorce it from the term "Bendien vanadium reaction" and its association with cancer; and thus to emphasize, in the first place, my complete agreement that on broad principles the association of a positive result with active malignancy is a matter of chance, and, in the second place, to confirm my conviction that with the proper understanding of the mechanism of these reactions they may then be applied to other diseases in a practical manner, which has proved of much value and assistance not only to the realm of everyday clinical medicine but also as a guide to therapeutic research.—I am, etc.,

London, W.1, March 20. HARRY COKE.

Sulphanilamide Rash

SIR,—In December, 1938, I treated a boy aged 10 for a streptococcal throat infection with sulphanilamide, 5 grammes four-hourly. On the third day he developed an irritating macular rash on the back, thighs, legs, and arms. Last week I treated the same boy with sulphanilamide for an ear infection, and on the third day he again developed a rash exactly like the first one in distribution, appearance, and irritation. The rash appears to resemble closely the one described by Captain G. W. Palmer and Captain D. R. Hanbury in their clinical memorandum in your issue of March 18 (p. 561), and in this case of mine the evidence strongly suggests that sulphanilamide was the only possible explanation.—I am, etc.,

Devon, March 20. J. V. MAINPRISE.

Dangers of Patent Medicines

SIR,—I have just had to attend a man who was poisoned by some patent medicine containing one of the phenacetin series of drugs. If nothing can be done to stop the sale of such dangerous drugs, cannot a general warning be issued to the public? They cannot know how dangerous these are. In this case the patient when young had some trouble with his kidneys, and so may be more susceptible; but surely he should have had some intimation that the article was dangerous. I may add that it is impossible in private practice to have analyses made, and one has to judge from all evidence.

The symptoms were those of a "fit." He became dizzy, then tremulous; went into tonic spasm, followed by clonus, and was pale in the face. On returning to consciousness he was very nervous, and after three such attacks was in fear of more. His blood pressure was 122/70, pulse 54, and temperature 98°, but may have been less. He vomited before and after the attacks, but I did not see any of the issue. The only thing to be noted on examination was that biceps and knee reflexes were extremely brisk, but I could get no response from the ankle at all. The abdominal reflex was quite normal. The eyes were dilated, but contracted to light, etc. The difference between the reflexes was very marked; I suppose that the spinal ones had been increased and those from the brain dulled. The urine contained large amounts of reducing substances, but no sugar; very much like the salicylates.

Is it not time that the public were protected and something done with regard to this continually recurring problem?—I am, etc.,

London, March 10. W. F. COOPER.

Obituary

J. S. RISIEN RUSSELL, M.D., F.R.C.P.

Consulting Physician, National Hospital, Queen Square, London

Dr. James Samuel Risien Russell, the well-known London neurologist, died suddenly on March 20 at his home in Wimpole Street, aged 75.

A medical student of Edinburgh University, he graduated M.B., C.M. in 1886 and took the gold medal at the M.D. examination in 1893. He came to London for post-graduate study at St. Thomas's Hospital, and won a British Medical Association scholarship in 1895. After further courses at clinics in Berlin and in Paris he was appointed resident medical officer at the Queen Square Hospital for Nervous Diseases, and thus began a long and successful association with that institution, where he became in turn assistant physician, physician, and consulting physician, and a member of the board of management. For many years his gifts as a teacher were widely recognized by medical students and graduates from the London hospitals and elsewhere, who learnt much of the art of neurological diagnosis from his clear-cut talks in the wards at Queen Square. Risien Russell was appointed also to the visiting medical staff of University College Hospital, reaching the rank of full physician and professor of clinical medicine and of medical jurisprudence at University College. The great success he achieved in private practice was, however, largely derived from his skill and acumen in the diagnosis and management of diseases of the nervous system. He was a past-president of the Neurological Section of the Royal Society of Medicine, and served as vice-president of the Section of Psychological Medicine and Neurology at the Annual Meeting of the British Medical Association in London in 1910. He was a corresponding member of the Société de Neurologie de Paris and an honorary member of the Canadian Medical Association.

Risien Russell had obtained the M.R.C.P. as long ago as 1891, and was elected a Fellow of the Royal College of Physicians of London in 1897. He wrote a good many papers, which appeared in current medical literature, and contributed articles on diseases of the nervous system to Allbutt's *System of Medicine*, the *Encyclopaedia Medica*, Quain's *Dictionary of Medicine*, and Gibson's *Textbook of Medicine*. In later life he attracted public notice by acting as chairman of the National Society for Lunacy Law Reform and by the evidence he gave as an expert witness in *causes célèbres* in the High Court.

ROBERT GIBSON, M.D.

Honorary Physician, Manchester and Salford Skin Hospital

Dr. Robert Gibson, the well-known Manchester dermatologist, died at his home in Didsbury on March 17. He was born at Port William, Wigtownshire, and educated in Edinburgh at the George Watson College and the University. He graduated M.B., Ch.B. in 1898, and was

then resident for a time at Carlisle Dispensary, but went very soon to Hong Kong to take up general practice there. His keenness and ability led to his being appointed lecturer in medicine at the Chinese College, deputy for the port of Hong Kong medical officer of health, and visiting physician to the Alice Memorial Dispensary. After four years he returned home, and to freshen up his knowledge took resident posts at the Soho Square Hospital for Women and Children and at the Liverpool Children's Hospital. He settled in Manchester in 1905 and soon developed a large practice within three miles of the centre of the city. In 1913, while he was performing a tonsillectomy, his left hand was bitten. Such a grave infection followed that the arm had to be removed above the elbow. This crippling disability was a great shock, but his natural force of character enabled him to carry on with his practice for a time until the difficulties of doing so and of driving a car all day with one arm directed his thoughts to the possibility of specializing in dermatology. So in 1917 he took an appointment as medical officer to the Manchester and Salford Hospital for Diseases of the Skin. The loss of an arm prevented him from joining the R.A.M.C. and serving abroad in the war, but at home he worked at different hospitals, undertaking the duties of those members of the honorary staff who were away. After being three years at the Manchester and Salford Hospital for Diseases of the Skin he was elected to its honorary staff, and later was appointed to the Salford Royal Hospital, to the municipal hospital, and to the Booth Hall Hospital for Children. He was, too, a university lecturer in clinical dermatology. Dr. Gibson was often a witness in the county courts in claims for compensation for dermatitis or ulceration produced by dust or liquids, and in cases of mule-spinner's and other forms of cancer. His evidence was always given in an assured, concise, and convincing manner. In addition to his dermatological work he had some private practice in the treatment of venereal diseases, and he became skilful in the injection of varicose veins. A paper by him on this subject appeared in this *Journal* in 1928. He was a member of the Dermatological Section of the Royal Society of Medicine, and in local life for many years was a leading spirit in the Medico-Ethical Association, of which he had been secretary, vice-president, and finally, in 1929, president. He was secretary of the Manchester Medical Society for four years and vice-president for two. He had been a member of the British Medical Association for thirty-eight years. In spite of his disability he played a good game of golf, and on vacations fly-fishing occupied his time. At home bridge in the evenings was a favourite recreation. Dr. Gibson was popular among students as a good teacher of a difficult subject. He was a precise thinker and a clear speaker. His generous, cordial, and breezy nature made him many friends, and any one of them seeking his advice on professional or personal matters, as often happened, was sure of a sympathetic hearing and helpful suggestions.

J. E. SHAW, M.B., C.M.

Consulting Physician, Bristol Royal Infirmary

We regret to record the death on March 9 of Dr. John Edwin Shaw, a veteran physician of Bristol, who had been a member of the British Medical Association for sixty-four years.

Born at Bath in 1848, he spent his schooldays there, and began the study of medicine in Bristol at the age of 18. He went on to Edinburgh in 1869, and while a student of the University became president of the Royal Medical Society. Having graduated M.B., C.M.Ed. in 1872, he was appointed house-physician at the Edinburgh Royal Infirmary. Three years later he set up in practice at Clifton, and was appointed medical adviser on lunacy cases to the Bristol justices, a post he held for forty years. From 1877 to 1907 he was one of the honorary physicians at the Bristol Royal Infirmary. Before the Bristol Medical School became merged in the University he was joint professor of medicine and lecturer in materia medica; he had also been honorary physician to the Blind School and to the Clifton Dispensary.

Dr. Shaw was a very familiar figure in Clifton for more than sixty years. He never took to a motor car, but did all his visiting on foot. Throughout life he enjoyed wonderful health, and until his last illness never spent a day in bed except when he had scarlet fever as a schoolboy. He was one of the original members of the Bristol and Gloucestershire Archaeological Society, and a past-president of the Bristol Medico-Chirurgical Society.

ANTOINE BÉCLÈRE

Dr. J. D. Rolleston writes: It is important to realize that Antoine Béclère, whose obituary appeared in the *Journal* of March 18 (p. 591), was not only an eminent specialist but also, in Professor Regaud's words, "a plurivalent clinician." The truth of this statement is best shown in the French jubilee volume dedicated to him on the occasion of his eightieth birthday, in which his contributions not only to radiology, as in the *Festschrift* devoted to him by *Strahlentherapie*, but also to paediatrics, experimental medicine, neurology, endocrinology, diseases of the chest, diseases of the abdomen, and gynaecology formed the subject of appreciation by well-known specialists. While still an interne he took a keen interest successively in ophthalmology, otology, dermatology, and general medicine, but subsequently became engrossed in paediatrics, and particularly the study of acute infectious diseases in children. In his inaugural thesis in 1882 on the contagion of measles he showed that the disease was contagious for only eight to ten days, and not for six weeks as had previously been supposed. In 1896, when he first became interested in radiology, he introduced treatment of small-pox by the serum of vaccinated heifers and made a study of serum sickness. Vaccinal immunity also formed the subject of some of his early contributions. The affection and esteem in which he was held by his colleagues and friends at home and abroad find eloquent expression in the jubilee volume and the editorial introduction to the *Festschrift* of *Strahlentherapie*. Professor Regaud, who describes him as "le modèle du Maître," has summarized his character in the five words "curiosité, labeur, ténacité, probité, bonté."

The death of Dr. HARRY BACON WILKINSON, aged 71, occurred in Southport on February 22 after a long and painful illness. He was born in Southport on March 28, 1867, the son of James Wilkinson, the proprietor of a preparatory school. He entered Guy's Hospital in 1885, and qualified M.R.C.S., L.R.C.P. in 1892. His health was not good at this time, and so he served in the mercantile service for a few years, afterwards holding the appointments of clinical assistant, throat department, at Guy's, clinical assistant at the Golden Square Hospital, house-surgeon at the Children's Hospital, Nottingham, and assistant medical officer, Worcester City and County Mental Hospital. He was then appointed to the Plymouth Mental Hospital, to which he was attached as deputy medical superintendent until he retired in 1932, except for time spent as captain R.A.M.C. during the war. Dr. Wilkinson was a neurologist on the Ministry of Pensions, Plymouth district. He had served with the Mediterranean Expeditionary Force in Serbia, Salonika, Egypt,

and Turkey. He was a member of the Royal Medico-Psychological Association, the British Medical Association, and the Southport Medical Society. His chief and almost sole interest was in neurology and psychology, and into his work he put the whole of his energy. Before retiring early signs of his incurable disease were present, but he was always optimistic and took a keen interest in medical matters, perhaps his chief regret towards the end of his life being his inability to attend the meetings of the local medical societies. He was unmarried, and leaves behind him a devoted brother and sister.

Dr. WILLIAM HENRY COOKE, who died on February 26, was a well-known member of the medical profession in Bath. The only son of Dr. William Bishop Cooke of Gloucester, he studied medicine in London at St. George's Hospital, taking the M.R.C.S. and L.R.C.P. diplomas and the L.S.A. in 1892, the M.D.Brux. (with high distinction) in 1895, and the F.R.C.S.Ed. in 1899. He had been house-physician at St. George's, honorary medical officer to the Eastern Dispensary, Bath, anaesthetist and assistant surgeon to the Royal United Hospital, and surgeon to the Bath War Hospital. He joined the Bath Division of the British Medical Association in 1896. Dr. Cooke's death recalls the notorious Muswell Hill murder case nearly forty years ago, when the criminals Fowler and Milsom, who were afterwards hanged, were captured at Bath. In the process of capture Fowler, a huge man of enormous strength, fought with the policemen, by whom he was eventually felled and overcome. In an unconscious condition he was removed to the Royal United Hospital, and received by Dr. Cooke, who was on duty at the time.

The death on March 2 of Mr. CLEMENT TREVES NEVE of India House, Addiscombe Road, has bereft Croydon of a man whose high professional skill, charm of manner, and kindly spirit earned for him the love and esteem of all those with whom he came into contact. Born in 1887 in South India, and educated at Repton, he studied medicine at St. Bartholomew's Hospital, obtaining the M.B., B.S.Lond., and M.R.C.S., L.R.C.P. in 1911, followed two years later by the F.R.C.S.Eng. He was also a gold medallist. During the great war he served as a captain in the R.A.M.C. in the Mediterranean, Egypt, and France. A member of a distinguished family of physicians and surgeons, he was a nephew of the late Sir Frederick Treves. Although a man of many interests, his professional work was always the thing he had most at heart. As an honorary surgeon to the Croydon General Hospital and a member of the board of management, he gave much of his time and skill. He was for many years on the visiting staff of St. Mary's Maternity Hospital, Croydon, and took a keen interest in the Croydon crèche. Ever since he became a member of the British Medical Association he always followed with great interest its activities, and contributed scientific articles to the *Journal*. Being for some years a member of the Surrey Branch Council and member of the executive committee of the Croydon Division, he was elected chairman of the Croydon Division 1933–4. In addition to all his honorary work and service Mr. Neve conducted a large private practice built up on his clinical acumen and high standard of surgical skill. At the memorial service held in the parish church some 500 people gathered to pay tribute to his memory and respect to his widow and four children. Of him it may be truly said that kindliness was the foundation upon which his life was built.

Dr. ARTHUR JOHN COLLIS, late medical superintendent of the Ministry of Pensions Hospital, Leicester, died on March 8 at Stourbridge. He was born at Old Swinford, Worcestershire, in December, 1868, and was educated at Stourbridge Grammar School, Leamington College, and Cambridge, continuing his medical studies at Guy's Hospital. He graduated B.A. in the Natural Sciences Tripos of 1890, and took the M.A. and M.B., B.Ch. degrees in 1894, proceeding to the M.D. in 1901. He had been house-surgeon at the Central London Ophthalmic Hospital, and resident medical officer at the Weston-super-Mare Hospital and Dispensary and at the Children's Hospital, Newcastle-on-Tyne. He was for five years a combatant officer in the Territorial Force, and during the war attained the rank of lieutenant-colonel R.A.M.C.(T.) and received the Territorial Decoration. In 1919 he became head of the Ministry of Pensions Hospital, Victoria Park, Leicester, and retired after six years' service. Dr. Collis joined the British Medical Association in 1896, and was elected an associate member of the Dudley Division in 1932; he was a past-president of the Newcastle-on-Tyne Clinical Society.

Dr. ALFRED GEORGE JACQUES, assistant general physiologist at the Rockefeller Institute in New York City since 1926, was drowned on February 20 when his research boat upset in Bermuda. Born at Sutton, Surrey, in 1896, he was educated in Canada, receiving his Ph.D. from Harvard in 1931.

The death took place on March 11 at Northwood, Middlesex, of Mr. CHARLES ALEXANDER CLARK, L.D.S., consulting radiologist to the Royal Dental Hospital, a former vice-president of the Odontological Section of the Royal Society of Medicine, and past-president of the Metropolitan Branch of the British Dental Association. Mr. Clark wrote a book on dental radiography, and also the section on that subject in Sir Norman Bennett's *Science and Practice of Dental Surgery*.

The following well-known foreign medical men have died: Dr. HANS NEUMAYER, professor of rhino-laryngology at Munich; Dr. TATSUKICHI IRISAWA, honorary professor of internal medicine at the Tokyo Imperial University, aged 74; Dr. ADDINELL HEWSON, emeritus professor of anatomy, Graduate School of Indiana University of Pennsylvania, aged 83; Dr. MAURICE RIVIÈRE, honorary professor in the Bordeaux faculty of medicine and officer of the Legion of Honour; and Dr. LOUIS DELATTRE, chief inspector of hygiene, member of the Council of the Red Cross, and a man of letters.

Medico-Legal

A SHORT GESTATION PERIOD

Writers on legal medicine usually devote much space to prolonged gestation but dismiss short gestation in a few words. The reason is possibly that premature children hardly ever live, and the signs of prematurity are fairly obvious. The President of the Divorce Court recently had before him a case[1] which he said was the most remarkable he had dealt with since he had sat in that Division.

The husband charged his wife with adultery on the sole ground that she had given birth to a child 174 days after the earliest possible date on which conception could have taken place. He brought no evidence of any association with another man. The wife cross-petitioned for divorce on the ground of her husband's adultery. Evidence was given that the birth took place immediately after the wife had had a bad fall. An experienced midwife said that, in her experience of over thirty years, this and one other child were the two most extreme cases of premature birth that she had ever seen. The wife's mother said that about one and a half hours after birth the baby was like a tiny shrivelled doll and her legs were like sticks. The colour was as though she had been bruised all over; she had no nails, and was covered with down. The

[1] Clark v. Clark, 1939, 2 All E.R. 59.

weight four days after birth was, so far as could be ascertained, two and a half pounds. The child was born on February 10, 1936, and is alive, though her legs are still in irons.

The President of the Court (Sir Boyd Merriman) said he was asked to find that the child, merely because she was still alive, could not possibly be the child of the husband. Taylor on Medical Jurisprudence, to which he was referred, says (p. 46): "It would be in the highest degree unjust to impute illegitimacy to offspring, or want of chastity to parents, merely from the fact of a six-months child being born living and surviving its birth." He found it difficult to understand, in the face of that authority, why he should be bound as a matter of law or of nature to find that the husband was not the father of the child.

The date of the intercourse from which conception resulted was fixed beyond possibility of doubt at August 20, 1935. The President discussed the medical evidence in great detail in his judgment, and showed that he had devoted close study to the question of the actual date of conception. He remarked that as it was almost impossible in the ordinary case to ascertain the date on which conception took place, most of the tables and statistics were based on a notional period. Gestation was reckoned from an artificial date, that of the last menstrual period. That was unlikely to be the date of fertilization, which, said his Lordship, would probably take place at any time up to the date when the next period was due to begin. It was therefore possible that what was ordinarily called a seven-months or 196-days child might have been conceived twenty-two days after the beginning of the last period, and therefore only 174 days from birth. He noticed that the wife said in her evidence that she menstruated scantily and irregularly and never had a proper period. On the day after August 20 she had bleeding of a kind, and if that were assumed to be the imperfect period which sometimes followed conception, then the date of the previous period, from which a medical man would reckon the notional time of gestation, would be twenty-six or twenty-seven days earlier, and would give the child a notional foetal life of some 200 days. On this reckoning the present case might be comparable with any of the recorded cases of a gestation period of between 190 and 200 days. When its facts were reduced to the same terms as those upon which the theories and the tables were based, there was nothing extravagantly improbable about this child being viable. He was satisfied that the wife was telling him the truth when she said that the child was conceived in wedlock. He granted the wife's cross-petition and pronounced a *decree nisi* of divorce in her favour.

While few medical men would quarrel with the President's decision, and all would applaud his very close analysis and comprehension of the medical evidence, yet his suggestion that conception might take place twenty-six or twenty-seven days after a period seems somewhat debatable. Knaus, Ogino, and others have produced strong evidence that (1) ovulation takes place a fortnight before the beginning of the next period; (2) the life of an ovum before fertilization is only a few hours; (3) the life of a spermatozoon in the female body is only two days. If these assertions are true—and they command a considerable body of support among gynaecologists—then conception cannot take place nearer than ten days to the date when the next period would be. The difference between the actual and the notional period of gestation is therefore not likely to be longer than about eighteen days. The difference is, however, not a very serious one, and no calculation based on these beliefs is of any value in the case of a woman whose periods are very irregular.

In France this wife would have been defeated by an irrebuttable presumption of law that pregnancy cannot be shorter than 180 days. In English law there is fortunately no such arbitrary rule, nor is there any need for one. Each case is decided on the evidence, and no one can deny that in this instance the President had ample evidence on which to find as he did. The case is, nevertheless, one of great interest from the standpoint of legal medicine, for there are very few examples on record of children so premature living for more than a few weeks.

A DOCTOR'S WATER RATE

Towards the end of last year Dr. D. F. Yuille of Hull, with the help of the London and Counties Medical Protection Society, successfully resisted a claim made against him in the county court by the local authority for a few shillings for the water which he used in dispensing medicines and in cleansing his surgical instruments. The corporation said that this was not a domestic use of the water, but His Honour Sir Reginald Mitchell Banks, K.C., held that it was. The corporation appealed, and the point of law was decided by the Court of Appeal on March 13.

Lord Justice Scott, giving the judgment of the court, showed that the test question is whether the use itself is a domestic one, not whether the circumstances of the use are domestic. For instance, water used for water-closets and baths in a factory where no one lived was held by the House of Lords to be used for domestic purposes: Colley's Patents, Ltd. *v.* Metropolitan Water Board (1912, A.C. 28). Water used for cooking and washing-up in a restaurant attached to a public house was held by the Court of Appeal in Metropolitan Water Board *v.* Avery (1914, A.C. 118) to be put to a domestic use. That court held that as the use of the water was in its nature domestic the supply was for domestic purposes; the increase of the quantity due to the supply of lunches made no difference. Mr. Justice Channell said at an earlier stage of that case that it is trade use of water, and not increase caused by trade of domestic use of water, which the Metropolitan Water Board Act, 1927, Sect. 25, places outside domestic purposes. Lord Atkinson said when the case went to the House of Lords that the question is the character of the purpose for which the water is supplied, and not the character of the premises to which it is supplied. In Lord Justice Scott's view the addition of water to medicine is necessarily a domestic purpose. He could, His Lordship remarked happily, imagine no more domestic purpose than internal administration. Moreover, in the matter of the surgical instruments, he said that to wash or clean anything is *prima facie* a domestic purpose, and he could see no ground for saying that, because these things were surgical instruments which the doctor was going to use in his practice, he ceased to use the water for a domestic purpose. The other Lords Justices agreed, and the appeal was dismissed, but leave to appeal to the House of Lords was given.

The intention of Parliament is often a matter for speculation, and the onlooker may be forgiven for suspecting that Parliament did not envisage a distinction between a domestic use of water and the use of water for domestic purposes. Very often the strict scrutiny which the court applies to the words of a statute leads to a somewhat unexpected interpretation.

OBJECTIVE EVIDENCE OF EPILEPSY

A man who had strangled a small girl was found by the jury at Sussex Assizes on March 8, in the illogical language which is still regrettably part of our law, to be "guilty but insane." The man's own account of the incident was:

"I saluted a man, and as I did so a blackness came over my eyes with terrible pain. I remember nothing more until I came to, sitting on the seat with my head in my hands. I saw her little legs under the seat and the venetian blind was in front. I covered her with it."

The police evidence gave the man a perfectly good character, with the reputation of being a "good fellow" and fond of children. He and his wife had adopted a boy of 4. His counsel said that he was so harmless when in possession of his mind that he had not even the heart to kill a chicken or a rabbit. There was no sign of a sexual assault. Dr. L. A. Parry of Hove said he had concluded that the murder was committed in a state of epileptic mania, quite independently of the man's knowledge and will. He did not think the man had enough education to invent his account. There was a long history of epilepsy, borne out by the war record of the accused.

An outstanding feature of the case was the evidence of Mr. W. Grey Walter, whose work on the electro-encephalograph is now well known. Mr. Walter is a physiologist attached to the Maida Vale Hospital for Nervous Diseases, and he gave evidence of the results of examining the head of the prisoner with this instrument, which records the changes in the tenuous bio-electric currents generated by the brain. He had found, he said, an abnormally slow electrical rhythm proceeding from the frontal lobe of the brain, of the particular form especially associated with epilepsy. He had found similar reactions in about two thousand persons at Maida Vale. Dr. W. McCartan, medical superintendent of Brighton Mental Hospital, said he had not the slightest doubt that the machine was of assistance in diagnosing epilepsy. The jury, after a seven-minutes retirement, found the prisoner guilty but insane, and the judge made the usual order that he be detained during His Majesty's pleasure.

Violent crime committed during epileptic automatism is a commonplace of medico-legal literature, but the defence is not easy to establish successfully in this country. Mr. Justice Charles indicated in his summing-up that he was familiar with the possibility. A method which renders it possible in some cases to prove the existence of an epileptic cerebral disturbance in the intervals between the attacks may be of great medico-legal value.

Medical Notes in Parliament

In the House of Lords on March 16 a Select Committee was set up on the Bastardy (Blood Tests) Bill. It consists of Lord Beauchamp, Lord Dawson of Penn, the Bishop of Salisbury, Lord Limerick, Lord Strathcona, Lord Merthyr, Lord Swinfen, and Lord Brocket.

The Mining Industry (Welfare) Bill was read a third time in the House of Lords on March 16.

The Patents and Designs (Limitation of Time) Bill was read a third time in the House of Lords on March 21, and the Adoption of Children (Regulation) Bill was reported from committee with amendments.

The Puerperal Pyrexia Regulations, 1939 (England), were laid on the Table of the House of Commons on March 20.

The Camps Bill, "to promote and facilitate the construction, maintenance, and management of camps of a permanent character," was presented by Dr. Elliot in the House of Commons on March 20, and was read a first time.

The House of Commons on March 21 discussed safety in mines. A discussion was proposed on March 22 upon the report of the Committee of Inquiry into the Anti-Tuberculosis Service in Wales and Monmouthshire.

The accounts of the income and expenditure of the General Medical Council and of the Branch Councils for 1938 were presented to Parliament on March 21, as were those for the Dental Board for the United Kingdom.

CANCER BILL IN THE LORDS

The second reading of the Cancer Bill was moved in the House of Lords on March 14 by the DUKE OF DEVONSHIRE, who said its main purpose was to establish a cancer service under which there would be available in every part of the country modern facilities for the diagnosis and treatment of the disease. At present such facilities existed in some voluntary hospitals and some municipal hospitals, but in wide areas of the country they were far from adequate. The Bill had been criticized in the House of Commons because it contained no provision for further research into the nature, causes, and cure of cancer. Provision for the diagnosis and treatment of disease and provision of funds for specialized research work were separate and distinct. Lord Runciman, Lord President of the Council, and not Dr. Elliot, was responsible for allotting funds to medical research, and even if he thought that at present it was desirable to find more money for research into cancer this Bill, which was an administrative measure, dealing with the machinery of local government, would not be the appropriate method. Lord Runciman could increase his grant to the Medical Research Council without legislation. A great deal of research was being carried on by the Imperial Cancer Research Fund and the British Empire Cancer Campaign, which between them spent £90,000 a year on research and gave Dr. Elliot assurances that there would be no relaxation of their efforts. A Clinical Cancer Research Committee had been formed of representatives of the London teaching hospitals and a proportion of the special hospitals in London. This committee hoped to investigate all the seventeen thousand new cases of cancer which were estimated to be admitted to London hospitals each year. At the hospitals which were co-operating, cancer registrars would record by a uniform system particulars of all cancer patients who attended at the hospitals, and the committee would thus be able to compare results obtained by different methods of treatment. Arrangements were being made to secure adequate records of all cases treated under the Bill. The Minister had arranged for the appointment of a special subcommittee of the existing Medical Advisory Committee to advise him in the exercise of his functions under this Bill and to be consulted on the records required, the methods of analysis, and the publication of results. The Medical Research Council was prepared to assume responsibility for the greater efforts in this direction which had become a matter of urgency. If the larger number of cases treated under this Bill opened new lines of research, Lord Runciman and the Chancellor of the Exchequer would listen to representations from the Medical Research Council. The death rate from cancer was rising, and it was now second on the list of fatal diseases. In 1937 in England and Wales the number of deaths from cancer was 74,000. Even that did not represent the full mortality, for medical men did not certify death to be due to cancer if they could reasonably avoid doing so. The death rate from cancer, which in 1901 was 835 per million, was to-day over 1,600 per million. Other countries which had a registration system showed a high and increasing figure. The increasing incidence of cancer was due in some measure to the increasing average duration of life, and the mortality from cancer of certain of the more accessible organs was declining at almost every age, notably cancer of the lip, jaw, and skin. Some forms of cancer seemed to be disappearing altogether. Skin cancer due to exposure to irritants was preventable. It seemed certain that some of the health services were bearing fruit in reducing the incidence of the disease. Dental services, venereal disease services, and maternity care services were all preventing conditions which might ultimately have become cancerous. They could claim that knowledge of the treatment of the disease was increasing, and the records of the surgeons showed that patients, especially in the earlier stages of the disease, could be cured. Little progress had been made in knowledge of the causation and nature of the disease, but they knew beyond doubt that treatment both by radium and by *x* rays had some action on the cancer cells, which led to their destruction or to some change which facilitated their removal by the normal regenerative processes of the body. The object of the Bill was to make available the benefits of this advance in knowledge. In London at any time there were some eleven thousand sufferers from the disease, and about ten thousand received some form of treatment. In other extensive areas adequate or accessible facilities were not obtainable. These were notably a belt of country from the Tyne to the West Riding, nearly the whole of North and Central Wales, and a belt of country across England from the Wash to Devonshire. There were other minor areas. Dr. Elliot estimated after an exhaustive survey that 300 to 350 new consultation centres and twelve new treatment centres in addition to the existing twenty-two would have to be established, and that a thousand additional beds would have to be provided at existing hospitals. Under the Bill the new beds would be attached to existing and established hospitals because, especially in the remoter parts of the country, there might exist a dread of visiting a cancer clinic or cancer hospital. After detailing other provisions of the

Bill, the Duke of Devonshire said that Clause 4 dealt with advertisements. He reminded the House that last year Lord Horder called attention to the enormous growth of the quack medicine trade and to the incongruity of exercising no control over such a trade when an effort was being made to improve national fitness. In that debate Lord Horder had said the public was becoming aware that cancer was not cured by drugs, and that in fact "cures" for cancer had gone out of fashion. There was nevertheless a danger that with the increased publicity given to the fact that this disease was curable and the campaign which the Government was launching in this Bill there might be a recrudescence of these advertisements. Advertisement of these quack remedies was a great evil, and the Government was gratified that Clause 4 had been welcomed by the Newspaper Proprietors' Association and the Newspaper Society, and had been strengthened in the House of Commons at the instance of a member of one of these organizations. The House need not fear that the clause would hinder the beneficent work of faith healers and others who had, it was claimed, sometimes produced remarkable results. It did not prohibit an unqualified person from treating cancer so long as he did not advertise, and it did not prohibit an academic statement for the information of the public of results obtained by any method of treatment.

NEED OF PROVISION FOR RESEARCH

Lord BALFOUR OF BURLEIGH had given notice to move an amendment which, while agreeing to the second reading of the Bill, would have added words regretting that the Bill did not contain provision for increased research into the cause and treatment of cancer. He said the statement of the Duke of Devonshire on research would intensify the bad impression created in medical and scientific circles by the absence from the Bill of any reference to research. Lord Runciman had no funds at his disposal for research. The keeping of records and clinical research to which the Duke had referred had no relation to fundamental research into the cause of the disease, to which alone they could look for its mastery. The current report of the Medical Research Council dealt with the treatment of cancer in a manner which showed how tentative was the advance and how far they were from certainty that even in early stages a cure would be effected. The Medical Research Council, together with the British Empire Cancer Campaign and the National Radium Commission, agreed that it would be advantageous to have a cyclotron in this country available for medical and biological research and also for treatment by radiation, but none was so available, nor were there funds with which it could be provided. It seemed crazy to go ahead with an expenditure of £600,000 when new methods might come into view which might supersede those on which they pinned their faith. It was not true that a Government contribution to research would dry up the present sources of subscription. Only since the foundation of the Medical Research Council had the greatest private benefactions in aid of medical research been forthcoming, such as the Nuffield benefaction and the Wellcome benefaction.

MEDICAL SUPPORT FOR RESEARCH

Lord DAWSON OF PENN said the Bill had been welcomed by the medical profession with the one reservation which had been stated by Lord Balfour of Burleigh, who was chairman of the Medical Research Council. There had been an increase of knowledge in the treatment of cancer, and the Bill would bring the advantages of that knowledge to all classes. There was no difficulty in obtaining good surgery in the staffing of the centres, because surgery offered a good career to men of promise, who would come forward in sufficient numbers. But radiotherapy did not at present offer sufficient scope to encourage young men to take up its study, and this country was deficient in skilled radiotherapists. The Bill would not only provide facilities, but would enable the centres in which radiotherapy was practised to be adequately staffed. He supported the contention of Lord Balfour of Burleigh that a scheme of this kind should not be launched without a research scheme at its head instead of such a scheme being affixed to its tail in a few years. A research unit was needed at the head to explore new avenues, settle differences of opinion, and give light and leading to the centres which were compelled to apply themselves daily to the patients who sought their advice. Such a unit would inspire the whole system with new life and would make the difference between real vitality and mere routine. The cost of the research unit would be met many times over by avoidance of waste of effort before two years had passed.

Lord ADDISON agreed with Lord Balfour of Burleigh and Lord Dawson of Penn in regretting that the opportunity had been lost of associating the Bill with an organized scheme of research. Advice to the Minister of Health from the clinical committee associated with the management of the cancer centres would have no relation to what was really needed. It was most difficult to produce researchers, and they did not crop up unless sustained opportunities were given for young men and women to develop their abilities.

DEBATE RESUMED

The debate was adjourned until March 15. On its resumption Lord DONOUGHMORE said that as a layman watching cancer work throughout England, Scotland, and Wales he was saddened to see too much working in watertight compartments. Research workers were not sufficiently in touch with the clinicians; even among those treating the disease there was not always the co-operation which ought to exist. Cancer treatment was now given in about twelve hospitals in London and about twenty-two centres outside, counting England and Scotland. In some centres which he had visited the treatment in any suspected case of malignant disease was the result of consultation between a surgeon, a physician, a radiologist, an *x*-ray man, and probably a physiologist. That was the ideal, but unfortunately it was not the rule all over the Kingdom. Two years ago, in a discussion with a view to organizing a cancer centre in a county with a staff available to travel to various hospitals and deal with cancer cases, a distinguished surgeon said: "A cancer radiologist? I do not see how a radiologist can be any use to me in my work." He was by no means unique, and it was to be hoped that this Bill would break down some of the prejudices which undoubtedly hampered the progress of cancer work. Lord Donoughmore commended the provision of the Bill which enabled local authorities to pay the expense of a patient, and even of a companion, in order that they might come to centres where treatment was organized. Diagnosis and after-treatment could be local, but it was impossible to expect efficient treatment of cancer except in large hospitals. Edinburgh Royal Infirmary had already arranged by voluntary effort a system of vouchers by means of which patients were brought to them, and the result had been a great success. He wished that they could foresee under the Bill a more organized system for training radiotherapists. Radium sometimes got into the hands of the wrong people. It was urgent that wider facilities should be given for training of radium officers and for improving their status, and he hoped the Government would help with that, though the point did not arise on this Bill. The provision for keeping adequate records of cases was of great importance, and much useful work had already been done. He hoped care would be taken to build on the records already existing. Under this Bill for the first time the local authorities became responsible for the organization of cancer treatment; under the last Public Health Act, however, there had been opportunities for voluntary hospitals and municipal hospitals to come together, but half the local authorities had taken no interest in cancer and had left it with one or two small exceptions to the voluntary hospitals and to the medical faculties of the universities.

A RESEARCH WORKER ON CHEMOTHERAPY

Lord SUFFOLK AND BERKSHIRE said that he was working on research under a benefaction of Lord Nuffield, and he had not, during the debate, heard any reference to chemotherapy. Chemotherapeutic successes had nearly reached the stage where something of value might come from them. Chemotherapy had been successful in ten diseases, and had reduced the mortality of the worst type of pneumonia from 85 per cent. to a very small one. It was showing remarkable promise in the Royal Cancer Hospital under the direction of

Professor Kennaway and his co-workers. They had discovered a compound which when injected would reduce the size of a tumour to a small pin's head. This had not been tried in clinical medicine, but he prophesied that it would shortly be so, and he believed marked success would result. A radium plant cost something like £20,000 to install, but if this chemotherapeutical method happened to be successful it would cost 1s. 6d. This line of research might well have the support of a certain amount of money. It had been his experience to see an experiment which might have changed the whole problem of cancer held up for the lack of £12 10s. He had worked in the same laboratory with a man whose experimental work had arrived at a stage when results might have been expected at the very next step, but those who directed his research were forced to tell him that although they were sure his work was valuable the money was simply not there. He himself had been sent a scheme by a research worker and physician under which a central clearing house for direction of research and communication of published papers should be established. He knew that several eminent research workers on cancer had difficulty in finding references to other people's treatment and to the dosage of radium. He had heard of difficulty in finding statistics and records regarding deep *x*-ray therapy.

Lord SAMUEL said he believed all the most industrious medical men shared the view expressed by Lord Balfour of Burleigh, Lord Dawson of Penn, Lord Addison, and Lord Donoughmore, who had spoken as chairman of the National Radium Commission. The whole attitude of the State towards research was wrong, and the sums expended upon research were insignificant compared with the need.

Replying to the debate, the DUKE OF DEVONSHIRE said criticism of the Bill had been directed only to its defect in containing no provision for increased Government grants towards research. Parliament had decreed that the Minister responsible for allocation of funds to medical research should be the Lord President of the Council, and in the House of Commons it would be out of order to make in this Bill the financial provision which was almost unanimously desired by the House of Lords. Legislation was not necessary to enable the Government to allocate increased funds for research. He hoped that the authoritative statements made during the debate would have some effect on the Lord President of the Council. He himself would bring to the notice of the Chancellor of the Exchequer the representations which had been made and would urge him to lend an ear to them. Meanwhile he gave an assurance that nothing of the £700,000 a year which under the Bill was to be provided for treatment would be subtracted for research. As High Steward of the University of Cambridge he would take up a complaint made about participation by that university in the organization of cancer treatment.

Answering a further appeal by Lord Balfour of Burleigh, Lord STANHOPE said the provision of more money for research was receiving consideration on behalf of the Government, and he would represent to his colleagues in the Cabinet what had been said in the House of Lords.

Lord BALFOUR OF BURLEIGH then withdrew his amendment and the Bill was read a second time without a division. It was referred to a Committee of the whole House.

Nutrition of School Children

Mr. KENNETH LINDSAY on March 16 circulated the following table:

Classification of the Nutrition of Children Attending Public Elementary Schools Inspected during the Year 1938

Area	A (Excellent)	B (Normal)	C (Slightly Subnormal)	D (Bad)
	%	%	%	%
Lancashire	10.61	80.67	8.29	0.41
Derbyshire	16.46	63.91	19.16	0.45
Durham	14.64	60.41	23.39	1.54
Glamorgan	6.43	70.92	22.09	0.55

Bombing of Hospital in China.—Mr. BUTLER stated on March 13 that the Jenkin Robertson Hospital at Sian suffered three direct hits, resulting in the total destruction of the operating theatre, the *x*-ray department machine room, and two private wards. One Chinese nurse was killed, but the foreign members of the hospital staff were reported to have escaped unharmed. A strong protest was being made to the Japanese Government. The location of these buildings had been notified to the Japanese authorities and clear marks affixed. The right to claim compensation was being reserved.

Partially Blind Persons and the Acts.—Sir WILLIAM JENKINS asked Dr. Elliot to consider the advisability of giving more licence to oculists in certifying partially sighted pupils at the age of 16. Dr. ELLIOT answered on March 14 that he had no power to modify the statutory definition of a blind person for the purposes of the Blind Persons Acts. The criteria, set out in circulars issued to local authorities, for determining whether a person came within that statutory definition were based on expert ophthalmological advice.

Death following Vaccinia.—Mr. GROVES asked about the death of a man at Halifax from generalized vaccinia on January 15 last after being revaccinated in order to take a job in Shanghai. Dr. ELLIOT replied on March 14 that the cause of death of this man, which occurred nine and a half months after revaccination, was certified as myocardial failure following vaccinia. The operation was performed with lymph supplied by manufacturers holding a licence to manufacture lymph under the Therapeutic Substances Act.

Calcium Phosphate in Flour.—Dr. ELLIOT told Major Braithwaite on March 16 that calcium in small quantities was introduced into flour in the form of acid calcium phosphate to improve its baking qualities and also as a self-raising ingredient. He had no evidence that its use is detrimental to health. The Departmental Committee on the treatment of flour with chemical substances reported in 1927 that the use of this substance had then been a regular practice for nearly twenty years, and that after consideration of all available evidence they could not recommend its elimination.

Tuberculosis in Wales.—Dr. Elliot was asked by Dr. EDITH SUMMERSKILL on March 16 whether, in view of the recent report on tuberculosis in Wales and the revelation of the low standard of housing, he would take steps to make the appropriate county authorities take over the duties of the defaulting boroughs and submit a rehousing scheme for families living in overcrowded conditions. Dr. ELLIOT replied that he was not yet in a position to make any statement on the recommendations contained in this report. He was asking the Welsh Board of Health and local authorities in Wales for their observations. Meanwhile he expressed the gratitude of the House to the members of the committee. Reports had been received from time to time from his inspectors drawing attention to deficiencies in the public health services and in the housing arrangements in Wales, and broadly speaking these corresponded with the report recently presented. Dr. Elliot added that the local authorities whose actions had been questioned should have opportunity of making representations. He himself last summer went round the Welsh areas and had conferences to draw the attention of the local authorities to the terms now offered for rural rehousing. On the rest of the matters he had made repeated representations to the local authorities.

Dental and Ophthalmic Treatment for Panel Patients.—Mr. JENKINS on March 16 asked Dr. Elliot to consider the appointment of a departmental committee to report on the advisability of making available dental and ophthalmic treatment to all members of national health insurance approved societies. Replying to this question and one by Mr. SUTCLIFFE, Dr. ELLIOT said the provision of dental benefit and ophthalmic benefit as statutory benefits available to all insured persons was one of a number of suggested major extensions of the national health insurance and contributory pensions schemes

which would be examined when the time was opportune and placed in an appropriate order of priority, due regard being had to financial and other considerations involved. In the meantime he did not think it desirable that a special departmental committee should be appointed to investigate this suggestion. The average cost per case under the existing additional benefit arrangements was about £4 and the claim rate less than 10 per cent. of the persons eligible, but these figures bore little relation to the proportion of insured persons who might apply for treatment if a statutory benefit, including payment of the whole cost of treatment, were provided.

Mental Condition of a Convict.—Dr. EDITH SUMMERSKILL asked on March 16 whether Sir Samuel Hoare's attention had been drawn to a recent case of murder where the murderer, now proved to be of unsound mind, had already been sentenced for other brutal attacks on young women. Mr. GEOFFREY LLOYD replied that the Home Secretary had ordered a medical inquiry into the mental condition of this prisoner. Dr. SUMMERSKILL said the senior medical officer at Brixton and the medical officer at Wormwood Scrubs were both willing to certify this man, and said two other brutal attacks he had made during the last three years were due to mental instability. She asked whether young prisoners of this kind should not be kept under observation. Mr. LLOYD said there were powers for keeping young prisoners under observation after they left prison. It had not been possible to certify this man.

Occupational Mortality.—Dr. ELLIOT stated on March 20 that the Registrar-General's Decennial Supplement relating to occupational mortality in 1931, published in October last, was part of a series which cannot be taken in hand until the reports for the previous census have been completed. He added that every effort was made to secure the publication of the Registrar-General's statistical reports at as early a date as possible.

Infant Mortality in Scotland.—Answering Mr. Henderson Stewart and Mr. Kennedy on March 21 Mr. COLVILLE said the Scottish infantile death rate for 1938, while higher than the English rate, was the lowest on record, showing a substantial decrease on previous years. Local authorities had for many years had wide powers to provide health and medical services for expectant and nursing mothers and young children. Last year he had arranged conferences with the authorities to encourage greater interest in the care of young infants and pre-school children. Within the next few months authorities' schemes under the Maternity Services (Scotland) Act, 1937, would be in full operation. He hoped the complete domiciliary service thus provided will result in a further reduction of the infant mortality rate.

Duties of Port Medical Officers.—It has not yet been necessary to make regulations under either the Public Health Act, 1936, or the Public Health (London) Act, 1936, prescribing the duties of medical officers of health and sanitary inspectors of port health districts. The duties of these officers are at present prescribed in the Sanitary Officers (Outside London) Regulations, 1935, and the Sanitary Officers Order, 1926, respectively.

Medical Supplies for Civil Defence.—Reserves of medical supplies for the treatment of air raid casualties are being purchased in bulk by the Government and will be distributed for storage, mainly at hospitals, in the area of each scheme-making authority.

Notes in Brief

A large stock of bleaching powder for both military and civil purposes is being accumulated as rapidly as possible. A proportion of this stock will be distributed to local authorities, and would be available in the event of attack upon civilians by mustard gas or similar dangerous substances.

Dr. Elliot does not propose that the evidence given before the Committee of Inquiry into the Anti-Tuberculosis Service in Wales shall be published.

EPIDEMIOLOGICAL NOTES

Cerebrospinal Fever in 1938

In 1938 there was a considerable increase in the incidence of cerebrospinal fever, compared with the immediately preceding years, in Germany, England and Wales, Bulgaria, and Yugoslavia; while in Poland and Italy the disease remains prevalent, although not on the increase. On the other hand, in the United States of America the disease continues to decline; 2,824 cases were notified during the year, compared with the median value of 5,293 for the preceding eleven years. In Africa the disease acquired highly virulent epidemic characters, especially in French West Africa, where there were 4,556 cases and 2,416 deaths in the first six months of the year; in the same period 6,027 cases were reported in Nigeria, compared with 2,150 during the corresponding period of 1937. In the Anglo-Egyptian Sudan the disease has become much less prevalent since 1936, in which year there were 13,440 cases: in 1937 there were less than 400 cases and in 1938 less than 300. In China the disease appeared in epidemic form, especially in Shanghai (French Concession and International Settlement), Hong Kong, and Chosen. No figures are available for 1938 from Japan and Formosa.

Influenza

According to the latest information (week ended March 4) influenza is on the decline in Switzerland, Denmark, Hungary, the Netherlands, Scotland, Ireland, and England, except in Greater London. In the following week, although pneumonia (primary and influenzal) fell in London from 200 to 192, deaths rose from 69 to 75; in the same week both cases and deaths showed a considerable fall in Scotland, Eire, and Northern Ireland. In Germany 513 deaths from influenza were reported for the week ended February 25 in the 57 towns with a population of more than 100,000, compared with 491 in the previous week; but the general death rate fell from 17 per thousand to 16.9.

Typhoid Fever

Of the 12 cases of typhoid fever notified during the week 3 belong to the outbreak in the Wells Road district of Nottingham, in which there have been to date 29 confirmed cases with 2 deaths; in addition 1 suspected case is in the City Hospital under observation. Although no official statement has been made as to the source of infection, the situation seems to be well in hand. Recent cases have probably originated from contact with the first crop of cases.

Measles

Although a major epidemic is not expected, there has been a slight increase in the incidence of measles in areas in which notification is in force. In London notifications in the last three weeks have been 27, 32, and 43 (week under review), and in Scotland 97, 49, and 110; while deaths for England and Wales were 4, 4, and 7. In Birmingham the disease has almost attained epidemic proportions at 507 for the week, compared with 388 in the previous week. In the 126 great towns there were 7 deaths from measles during the week, compared with 55 in the corresponding week last year.

The Earl of Harewood, K.G., has accepted the office of president of the Health Congress to be held at Scarborough from July 3 to 8 by the Royal Sanitary Institute. The Congress will be divided into sections dealing with preventive medicine; engineering, architecture, and town planning; maternity, child welfare, and school hygiene; veterinary hygiene; national health insurance; hygiene in industry; tropical hygiene. There will also be conferences of representatives of local authorities, medical officers of health, engineers and surveyors, sanitary inspectors, and health visitors.

No. 10

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended March 11, 1939.

Figures of Principal Notifiable Diseases for the week, and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. Median values for the last 9 years for (a) and (b).

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns (125 in 1938) in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1939					1938 (Corresponding Week)					1930–8 (Median Value Corresponding Weeks)	
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)
Cerebrospinal fever	48	6	10		3	40	7	11	1	2		
Deaths		2	2				3	2				
Diphtheria	1,044	99	190	41	28	1,492	170	267	57	42	1,164	170
Deaths	24	2	3	3	—	40	5	9	2	—		
Dysentery	61	2	19		—	142	38	48		—		
Deaths				—	—				—	—		
Encephalitis lethargica, acute	1	1	1		—	5	—	—	1	—		
Deaths		2					3					
Enteric (typhoid and paratyphoid) fever	12	2	9	3	—	17	—	3	9	3	29	
Deaths	—	—	—	—	—	1	—	1	—	—		
Erysipelas			85	7	4			62	4	2		
Deaths		3					1					
Infective enteritis or diarrhoea under 2 years												
Deaths	44	8	4	9	1	50	17	4	6	2		
Measles		43	110		1			1,718		171		
Deaths	7	—	—	3	—	55	13	16	1	18		
Ophthalmia neonatorum	96	5	40		—	114	8	35		—		
Deaths												
Pneumonia, influenzal*	1,396	192	18	5	7	1,430	172	10	14	14	1,435	160
Deaths (from influenza)	261	75	13	1	1	76	12	3	3	1		
Pneumonia, primary			188	7				287	9			
Deaths		9		10	7		31		39	19		
Polio-encephalitis, acute	1	—				—	—					
Deaths		—					—					
Poliomyelitis, acute	3	—	2	1	—	4	—	—		—		
Deaths		—					—					
Puerperal fever	4†	4	4		1	1†	1	12	5	—		
Deaths		—					—					
Puerperal pyrexia	194	25	25		1	180	21	30		—		
Deaths												
Relapsing fever	—	—			—	—	—			—		
Deaths												
Scarlet fever	1,679	146	269	53	59	2,515	196	411	102	104	2,488	209
Deaths	2	—	—	—	—	6	—	1	1	—		
Small-pox	—	—	—		—	—	—	—		—		
Deaths	—	—		—	—	—	—		—	—		
Typhus fever	—	—	—	—	—	—	—	—	—	—		
Deaths				—	—				—	—		
Whooping-cough		290	530		36			70		17		
Deaths	18	4	9	2	—	14	3	—	2	—		
Deaths (0–1 year)	415	56	78	41	14	401	76	74	44	26		
Infant mortality rate (per 1,000 live births)	64	47				67	63					
Deaths (excluding stillbirths)	5,614	1,185	657	212	155	5,559	1,147	750	238	181		
Annual death rate (per 1,000 persons living)	13.8	15.1	13.3	14.3	13.7	13.7	14.4	14.1	16.1	16.0		
Live births	6,251	1,090	863	405	234	6,899	1,271	962	327	254		
Annual rate per 1,000 persons living	15.4	13.9	17.5	27.2	20.7	17.0	16.0	19.6	22.1	22.5		
Stillbirths	265	54	35			270	55					
Rate per 1,000 total births (including stillborn)	41	47	39			38	41					

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

† After October 1, 1937, puerperal fever was made notifiable only in the administrative county of London.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

At the Congregation held on March 17 the Senate resolved to confer the degree of Doctor of Science, *honoris causa*, upon Sir Henry Hallett Dale, C.B.E., M.D., F.R.S., honorary Fellow of Trinity College, Director of the National Institute for Medical Research.

The following medical degrees were conferred:

M.CHIR.—D. M. McGavin.

M.B., B.CHIR.—*F. A. Simmonds, E. K. Gardner, A. M. Thomas, J. D. Wade.

M.B.—R. H. Dale, A. C. Fraser.

* By proxy.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

At a meeting of the Royal Faculty of Physicians and Surgeons of Glasgow, held on March 6, with the president, Dr. John Henderson, in the chair, the following were admitted Fellows of Faculty:

Theodore Crawford, M.B., Ch.B., Tom McEwan, M.B., Ch.B., George Lightbody Montgomery, M.B., Ch.B., Lakshman Nandkeolyar, M.B., Ch.B., D.T.M. and H.

The Services

DEATHS IN THE SERVICES

Lieutenant-Colonel HUGH GREANY, Madras Medical Service (ret.), died at Wokingham, Berkshire, on March 5, a few days before his eightieth birthday. He was born on March 28, 1859, the son of John Greany of Mallow, Cork, and was educated at Queen's College, Cork, and took the M.D. and M.Ch. of the Royal University of Ireland in 1879. He entered the Indian Medical Service as surgeon on October 1, 1881, became lieutenant-colonel after twenty years' service, and retired, with an extra compensation pension, on April 27, 1912. He spent his whole service in military employ, and served in the China War of 1900, receiving the medal with a clasp. He rejoined for service in the war of 1914–18, serving in the hospital ship *Syria*; in the York Place Indian Hospital at Brighton from its opening in December, 1914, to its closure on December 31, 1915; and afterwards in various other posts. He was a younger brother of the late Major-General J. P. Greany of the Bombay Medical Service. He leaves a widow and two children. He had been a member of the British Medical Association for fifty-eight years.

Lieutenant-Colonel JIRVAN SINGH BAWA, C.I.E., Bengal Medical Service (ret.), died in India in December, 1938, aged 75. He was born on May 1, 1863, and was educated at Punjab University, where he qualified as L.M.S. in 1885, and at St. Thomas's Hospital, taking the M.R.C.S., L.R.C.P. in 1889. He entered the Indian Medical Service as surgeon on January 31, 1891, became lieutenant-colonel after twenty years' service, and retired on May 1, 1920. He went into civil employ in Burma in 1896, and in April, 1900, became superintendent of the Central Jail at Insein, inspector-general of jails in Eastern Bengal and Assam in 1910, and in 1912 obtained the same post in Bihar and Orissa. On January 1, 1918, he received the C.I.E. After retirement in 1921 he was appointed Director-General of the medical, sanitary, and jails department in the State of Hyderabad.

Major ALBERT JOSEPH CULHANE, I.M.S., died at sea on February 14 at the early age of 44. The son of the late James Culhane of Rathgar, Co. Dublin, he was educated in Dublin, London, and Bruges. Entering Sandhurst in 1914, he was posted to the South Staffordshire Regiment in 1915. At the battle of Passchendaele he was seriously wounded and gassed. In 1922 he resigned his commission and took up the study of medicine at the University College, Dublin, and qualified in 1927. He entered the I.M.S. the same year, and was posted to Abbotabad, and later Dharmsala. He returned in 1929 for the senior officers' course at Millbank and was promoted major in 1929. After postgraduate work in London and Vienna he returned to India and was posted to the North-West Frontier. In 1932 he was selected for civil employment, and was posted as civil surgeon, Benares. There he found work that was really congenial. He threw himself into the medical work of a large district and the improvement of the headquarters hospital. During his four years at Benares he proved himself a capable administrator and laid the foundations of his reputation in surgery. Culhane was a man who was solely interested in the welfare of his patients. He commanded the respect and admiration of his staff and inspired them to follow his example. From Benares he was selected to officiate at Lucknow for six months, and then proceeded on leave. He started postgraduate work on leave, but had to give it up on medical advice and spent the remainder of his leave in the South of France. On return to India he was posted civil surgeon, Naini Tal, and had been there for two years when, on January 18, he suddenly collapsed after his morning's work at the hospital. Less than a month later he died from carcinoma of the lung. Although he knew that he was seriously ill and suffered a great deal of pain, he carried on work with courage and determination till he fell in his tracks. Culhane was one of the most popular officers in the Service, who lived up to the highest ideals of his profession, and by his skill and devotion to duty inspired all who came in contact with him.

Medical News

The House of the British Medical Association, including the Library, will be closed for the Easter holiday from 5 p.m. on Thursday, April 6, to 9 a.m. on Tuesday, April 11 (Library, 10 a.m.).

The annual banquet of the Ophthalmological Society of the United Kingdom will be held at the Langham Hotel on Thursday, April 20, at 7.45 p.m.

The annual meeting of the Society for the Study of Inebriety will be held at 11, Chandos Street, W., on Tuesday, April 11, at 4 p.m., when Dr. Desmond Curran will open a discussion on "Some Present-day Problems regarding Alcohol and Drug Addiction."

The Duchess of Gloucester will open the new building of the Charterhouse Rheumatism Clinic in Weymouth Street, W., on March 29, which has been established at a cost of £33,000, including a gift of £5,000 from Lord Nuffield.

The Local Medical and Panel Committee for the County of London will move its offices on March 27 from 17, Russell Square, W.C.1, to Tavistock House (South), Tavistock Square, W.C.1. On and from that date the Committee's telephone number will be Euston 2584.

The Charing Cross Hospital Students' Ball will be held at Grosvenor House, Park Lane, W., on Friday, April 21, from 9 p.m. to 2 a.m. Tickets (£1 1s.) from the honorary ball secretary, 62, Chandos Place, W.C.2.

The General Assembly of the International Association for Prevention of Blindness will be held in London, on April 19, at 2.30 p.m., at the House of the Royal Society of Medicine, 1, Wimpole Street, during the Congress of the Ophthalmological Society of the United Kingdom. After the opening address by Dr. P. Bailliart, chairman of the International Association for Prevention of Blindness, there will be a discussion on the application of the Crédé method for the prevention of ophthalmia neonatorum in various countries. The opening report by Dr. A. H. H. Sinclair (Edinburgh) will be followed by reports from Dr. R. P. Wilson (Egypt), Professor F. Terrien (France), Professor von Szily (Germany), Dr. J. D. M. Cardell (Great Britain), Professor L. Maggiore (Italy), Dr. Conrad Berens (United States), and Professor Dr. A. Vasquez Barrière (Uruguay). Persons who wish to take part in the discussion after the opening reports have been presented are requested to send in their names to the secretariat of the International Association for Prevention of Blindness, 66, Bd. Saint-Michel, Paris, 6e, not later than April 10, together with the title and a brief summary of their communication.

The sixth biennial congress of the International Hospital Association will be held at Toronto from September 19 to 23. The programme was published in the issue of *Nosokomeion* for October, 1938.

The ninth French National Congress of Tuberculosis will be held at Lille from April 11 to 13, when the following subjects will be discussed: distinctive features and role of other types of the tubercle bacillus than the human type; puriform and purulent effusions in artificial pneumothorax and their treatment; anti-tuberculous prophylaxis by systematic examination of communities.

The Food Education Society (29, Gordon Square, W.C.1) has arranged the following two lectures, to be given at the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, at 8 p.m.: April 19, Mrs. E. C. Pillman Williams, M.B., lecturer in biochemistry, Royal Free Hospital, Bircher-Benner Memorial Lecture, "Diet in Rheumatism" (films will be shown). April 26, Sir Albert Howard, M.A., formerly director of the Institute of Plant Industry, Indore, and agricultural adviser to States in Central India and Rajputana, "Health, Nutrition, and Soil Fertility" (illustrated with lantern slides).

On January 18 a rift of ten years' standing in the ranks of the birth control movement in America ended with the amalgamation of the American Birth Control League and of the Birth Control Clinical Research Bureau to form the Birth Control Federation of America. Dr. Richard N. Pierson is president, and Mrs. Margaret Sanger honorary chairman, of the federation, whose headquarters are at 501, Madison Avenue, New York City.

The competition for the Umberto I prize is now open. This prize of 3,500 lire will be assigned, according to the decision of the Provincial Council of Bologna, for "the best work or invention in orthopaedics." Italian and foreign scientists are invited to take part in the competition. The arrangement of the competition and the award of the prize are fixed by a regulation which will be sent to whoever asks for it. Application should be made to the president of the Istituto Artopedico Rizzoli, Bologna, Italy. The competition will close on December 31, 1939.

The recently published volume of the work of the Polish Institute for Brain Research contains a study of Marshal Pilsudski's brain.

Dr. Leopold Mayer, editor of *Bruxelles-Médical* and president of the next congress of the International Society of Surgery, has been created an Officer of the Order of Leopold II.

Dr. M. Gerulanos, professor of surgery and president of the Graeco-German Society at Athens, and Geheimrat Uhlenhuth, emeritus professor of hygiene at Freiburg, have been awarded the Humboldt medal of the German Academy at Munich.

In connexion with the celebrations of the fiftieth anniversary of the foundation of the Pasteur Institute, a cinegraphic gala was recently made the occasion of the demonstration of a new Pasteur film, "Les Conquérants Pacifiques."

A Flemish Academy of Medicine consisting of six sections has recently been founded at Brussels.

The main offices of the Board of Education have been removed from Whitehall to Alexandra House, Kingsway, W.C.2. The official telephone number is Temple Bar 8020 and the telegraphic address of the Medical Department is Meducation, Estrand, London.

Bolton Royal Infirmary has received £1,000 from the executors of the late Sir Thomas Flitcroft, for twenty years an honorary surgeon to the hospital. The money is for the endowment of a bed in memory of Sir Thomas and his wife.

All "beauty doctors" practising in North Carolina have in future to be examined by the Wassermann reaction, and to submit to treatment if it is positive.

More than 50,000 persons, or nearly 1 per cent. of the population, of Indo-China are blind in one or both eyes. The chief cause appears to be defective prophylaxis against gonorrhoea.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS.—All communications should be addressed to the Advertisement Manager (office hours 9 a.m. to 5 p.m.). Orders for copies of the *Journal* and communications with reference to subscriptions should be addressed to the Secretary, B.M.A. House.

The TELEPHONE NUMBER of the British Medical Association and the *British Medical Journal* is EUSTON 2111.

The TELEGRAPHIC ADDRESSES are

EDITOR OF THE *BRITISH MEDICAL JOURNAL*, *Aitiology Westcent, London.*

SECRETARY, *Medisecra Westcent, London.*

The address of the B.M.A. Scottish Office is 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh;* telephone 24361 Edinburgh), and of the office of the Cumann Doctúirí na h-Éireann (I.M.A. and B.M.A.), 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin;* telephone 62550 Dublin.)

QUERIES AND ANSWERS

Snoring

"PERPLEXED" asks for advice on a bad case of snoring in a male aged 43, married three months. There is a deflected nasal septum but no objective nasal obstruction. The nose and pharynx are otherwise normal. This man's wife is kept awake if she be in any part of the same house as her husband, and is on the verge of a nervous breakdown. A separation is spoken of, and if the snoring cannot be stopped appears to be almost inevitable.

Income Tax

Removal to New Premises

"C. C. C." has moved to a house which he has bought. Can he claim a deduction for a proportion of the expenses of decoration and repair, and for electrical and other fittings?

*** The courts have held that where premises are bought in bad condition the expense of making them suitable for the purpose intended is part of the total capital cost, and is not allowable. On the other hand, if "C. C. C." was under any obligation with regard to the house he formerly rented —for example, if he had to pay for "dilapidations"—a reasonable proportion of that expense can be claimed. The cost of new fittings would not be allowable except to the extent to which it represents replacement of discarded fittings.

LETTERS, NOTES, ETC.

Country Hospitals

Mr. J. H. HALL, M.P., writes: A need which makes essential the provision of country hospitals has not yet been emphasized. I refer to the fact that if in war-time we have in existence no country hospitals which take town patients only, then the already complex problem of evacuation will prove insuperable. In time of war thousands of sick patients would have to be moved at short notice to billets where many may be without proper medical care and attention. Whatever the distinction made between those left and those taken away, many of them would be "border-line" cases, who would really be too ill to be moved. Unnecessary congestion would be caused, hindering the evacuation of others. Ambulances, nurses, and doctors would be preoccupied with this work at a moment when, in all probability, their services would be urgently required for a rush of fresh patients in the form of air raid casualties. In addition, any helpless patients left behind would be exposed to a bedlam of nerve-

shattering noise and possible death from blast, gas, or bombs, if not from shock. These patients unfortunately would be those who are most seriously ill and in need of constant attention. They would include many waiting for, or recovering from, major operations. All this could be avoided by developing the idea of country hospitals attached to central town hospitals on the lines of the pioneer work which the Princess Elizabeth of York Hospital for Children is carrying out at Banstead, in Surrey. It is particularly apt that a hospital for town children should take the initiative in this way, for the arguments advanced above are pathetically applicable to child patients. The advantages of country hospitals in peace-time are obvious and have already been stressed in the Press.

Control of Small-pox

Dr. C. B. DREW (Abu Usher Civil Hospital, Sudan) writes: I would like to support the views of Dr. A. G. Newell published in the *Journal* of December 31, 1938 (p. 1392). Variola inoculation is used in parts of this country, among some of the more primitive people, with disastrous results. It was extensively practised by the Arabs during the Mahdia (1883–98), and is still remembered by them as a scourge; in a recent vaccination drive here one of the greatest difficulties was to persuade the native that he was being vaccinated (which he does not understand) and not "variolated." There has been some confusion betwixt arm-to-arm vaccination, which, so far as I know, is not employed here, and variola inoculation, which in parts is extensively practised. Jenner would have been highly gratified with the faith placed in vaccination; one successful vaccination is believed by the native to confer immunity for life.

Heart Failure and Sudden Death

Colonel G. F. ROWCROFT (Coonoor, S. India) writes: What is the cause of death in so-called heart failure? Does heart failure cause death, or is it that death causes heart failure? I suppose most of us think the former, but it seems doubtful, and the latter seems the more probable. We all know of these cases of sudden death, and they are usually very similar. To mention only one or two as examples which come to my mind. A lady was seated with her two sisters, talking quietly together. Suddenly her head dropped, and going up to her they found she was dead. A man was seated talking quietly with his friends. He stopped talking, and they found he was dead. A man was in his garden playing with his children, apparently quite well. He suddenly fell dead. One might mention many others. There is a remarkable similarity in them all. There appears to be no preceding pain or other warning, though in some cases they have been known to have "weak hearts." Why should such sudden heart failure cause death? In spite of the "all or nothing" action of the heart one would expect some slight previous warning. *Are* such people really dead? Or (if the remedy could be applied) would immediate heart stimulation, by needling, injection of novocain, manual massage through the appropriate incision, etc., resuscitate them, as it can in surgical cases? One never hears of such casualties "coming round" again, yet we know of many instances, usually surgical cases under anaesthesia, where the heart has stopped beating for quite definite periods and has been started again, and the subjects revived. The interesting article on the regulation of arterial pressure in the *Journal* of January 28 (p. 172) tends to show that the long-held belief in the vasomotor centre in the medulla, maintained in the first instance by Starling, may require revision, and that vascular control may be governed by impulses from the carotid sinus and aortic arch. But a perusal of the very exact experiments Starling gives seems to show that there *is* such a centre in the medulla; he gives the exact spot. May not it and the sinus and arch all work together? May it not be that there is what one might call a "vital centre," or "life centre," somewhere in the body, possibly in the heart itself, which controls somatic life; and that when *this* is in some way overcome, heart failure automatically and necessarily follows? I have, on service, been close to a man shot through the heart, and he fell dead practically instantaneously. Why, if some such centre was not put out of action? He should have lived for at least a few seconds. But I have also seen a wild animal shot with an explosive bullet, and the heart absolutely shattered, yet it has run for about 100 yards, and many tiger shooters know of such cases, which of course is rather against the idea of—in their case at least—a "vital centre" in the heart.

Tonsillitis

Dr. J. W. THOMPSON (Walsall) writes: I have been very much impressed by cases of tonsillitis, not necessarily of the virulent streptococcal type, which have been accompanied in the early stages, throughout the illness, or in the later stages by abdominal pain, usually mild in nature. This pain is evidenced by muscular rigidity and by tenderness situated in the vast majority of cases in the right lumbar and iliac regions. My interpretation of these signs is that coincidently with the tonsillitis there is a widespread infection to a greater or lesser extent of the lymphoid tissue of the alimentary canal. Especially does this apply to the terminal ileum, where Peyer's patches abound, and to the appendix, in whose walls lie aggregations of lymphoid tissue. The so-called "gastric influenza" I look upon as a mild infection of these self-same lymph patches, its origin thus being in the terminal ileum and showing an analogy to tuberculous infection. In support of this idea it may be noticed that in children the gastro-intestinal tract very often bears the brunt of the initial stages of infection—vomiting, diarrhoea, and abdominal pain being the precursors of an attack of tonsillitis.

William Hunter's Coins

Dr. A. PINEY (London) writes: Mr. Sampson Handley's reference to the collection of coins made by William Hunter (*Journal*, February 18, p. 313) reminded me that I possessed a copy of the catalogue entitled: *Nummorum veterum populorum et urbium, qui in museo Gulielmi Hunter, asservantur, descriptio figuris illustrata.* This large volume, published in London in 1782, contains 354 pages of brief description of the individual coins, and sixty-eight plates on which the specimens are depicted. The copy I possess is marked in pencil in many places, as if the lists had been used to check the collection; and, in addition, there are pencilled descriptions above some of the illustrations. Is it possible that this may be the copy of the catalogue that was used by Hunter's executors when they examined his collection, or, even more thrilling thought, could the notes be in William Hunter's own hand? I am too poor a numismatist to know whether the volume is of interest; and I am far too ignorant to decide whether the pencilled remarks are such as could have been made in the late eighteenth century. It would be of very great interest if someone learned in numismatics could give an idea of the history of this volume; and, equally, it would complete Mr. Handley's remarks if we could know what became of the great collection of coins.

Dentists Register, 1939

The *Dentists Register* for 1939 has now been published for the Dental Board of the United Kingdom by Constable and Co., Ltd., price 12s., post free 12s. 6d. The total number of names appearing on January 1 of this year is 14,722, being fifty-eight less than the figure for 1938, but sixteen more than the figure for 1937. Of these, 8,818 (59.9 per cent.) are registered with medical, surgical, or dental qualifications, the remainder being registered under the provisions of the Dentists Acts of 1878 and 1921. The number of names added by registration was 408, including fifteen foreign and seven colonial dentists.

A Warning

We are informed that several doctors in the West of England have been imposed upon by a traveller purporting to be a representative of a firm in Plymouth, who called upon them to demonstrate a new crêpe rubber bandage. One medical man ordered three each of two sizes by way of trial, and as the cost was small (13s. 6d.) he paid cash and was given a pencilled receipt on a printed form. The bandages not having arrived in three weeks' time, he wrote to the address given on the order form, detailing the circumstances of the order and asking to hear from the firm. Getting no reply, he sent a registered letter to the same address asking for delivery of the goods ordered or the return of the money paid. This letter was returned by the Post Office, the envelope marked "Unable to effect delivery."

Corrigendum

In the review of *St. Thomas's Hospital Reports* in our issue of March 11, page 507, an error was made in stating "no price given." The price of the volume is 10s. for non-subscribers and 7s. 6d. for subscribers.